

amateur radio

Vol. 39, No. 11

NOVEMBER, 1971

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CONTENTS

Technical Articles—

Acitron SS8-400 Transceiver	5
A Tester for Field Effect Transistors	9
Drake 2-B Receiver on Top Band	3

General—

Amateur Radio Co-operation—YB Style	11
A Table of Distances between Australasian V.h.f. Locations	12
Australia	22
Correspondence: Novice Licensing	23
Distances between Australasian V.h.f. Locations	14
Divisional Notes	27
DX	21
Federal Awards	28
Federal Comment: The Space Conference—Geneva 1971	2
Intruder Watch	25
Key Section	19
Licensed Amateurs in VK	22
New Call Signs	22
Obituary	25
Overseas Magazine Index	9
Prediction Charts for November 1971	19
Silent Keys	26
Stolen	19
VHF	20
VKs Heard on 160 Metres	28
W.I.A. Novice Investigation Committee	25

Contests—

John Moyle Memorial National Field Day 1972	13
1971 Remembrance Day Contest Results	16

COVER STORY

The Eimac Division of Varian recently released three high-mu triodes
—the 8873, 8874 and 8875. They are compact, external-anode, ceramic-
metal triodes intended for use in zero-bias class B amplifiers in audio or
radio frequency applications. Further details may be obtained from Varian
Pty. Ltd., 82 Christie St., St. Leonards, N.S.W., 2065. (Additional descrip-
tions appeared in "Ham Radio" for January 1971.)

FEDERAL COMMENT:

THE SPACE CONFERENCE—GENEVA 1971

In the long term the World Administrative Radio Conference for Space Telecommunications of the International Telecommunications Union held in Geneva from 7th June to 15th July, 1971, may be found to be one of the most significant events for the Amateur Service in recent years. In the September issue of "Amateur Radio" a report on the proceedings and outcome of the Conference was published. I think it is now appropriate to examine the results of that Conference and, at the same time, to offer some comment on the implications flowing from it so far as they relate to the Amateur Service.

Previously, the Amateur Service has been defined in the I.T.U. Radio Regulations as a "service of self-training intercommunication and technical investigations carried on by Amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest". No alteration was made to this definition, but the Conference did adopt the definition of a new service, the "Amateur Satellite Service" in the following terms, "a radio communication service using space stations on earth satellites for the same purposes as those of the amateur service".

At first glance, this definition would appear to be an expression of convenience for use in footnotes. However, the significance of the adoption of this definition is far better than that. Many provisions of the Radio Regulations apply to the "Space Service" which is in turn defined as a "radio communication service". Therefore, as the Amateur Satellite Service is by definition a radio communication service, the doubt that has existed in the past as to the application of these provisions to Amateur Satellites is removed.

In my mind, even more significant than the result of the conference so far as it affected the Amateur Service was the opposition from so many countries to the Amateur Service. It is abundantly clear that the Amateur Service was supported by Australia as well as New Zealand, the United Kingdom, the United States of America, Canada, West Germany and other countries. The issue affecting the Amateur Service that produced so much opposition was the question as to whether or not Amateur

Satellites would be permitted in the Amateur shared bands. The countries that vociferously opposed Amateur Satellites in shared bands included Sweden, Norway, France, Switzerland, Portugal, U.S.S.R., Mexico, Greece, Spain, Netherlands, Italy, India and other countries.

We are fortunate that we enjoy the support of our administration. Comparisons with certain other countries must lead us to the conclusion that the Amateur Service, at least in some of those countries, does not enjoy a similar support.

The proposal to permit Amateur Satellites in shared bands had been meticulously investigated and recommended by the C.C.I.R., the I.T.U.'s technical advisory arm.

Of course the W.I.A. was particularly concerned about the 2 metre and 70 centimetre bands—the two bands that it was planned that the A.O.B. translator project would use. Despite some opposition, the principle of the unrestricted use by the Amateur Satellite Service of the exclusive bands, was accepted by the conference. This, of course, covered the frequency band 144-146 MHz, the worldwide two metre allocation.

However, there is no Amateur allocation between 146 MHz. and 24 GHz. that is not a shared band. In the final outcome, use of the segment 435-438 MHz. by the Amateur Satellite Service is permitted, thanks to the excellent lobbying of the I.A.R.U. team which saved the day at the very last minute. For the sake of completeness, it is useful to restate the relevant footnote to that segment:

"320A. In the band 435-438 MHz. the amateur satellite service may be authorised on condition that harmful interference shall not be caused to other services operating in accordance with the table of frequency allocations. Administrations authorising such use shall ensure that any harmful interference caused by emissions from amateur satellites is immediately eliminated."

Even this footnote was the subject of opposition from Indonesia, Singapore and to a lesser extent, Malaysia.

No doubt in a number of cases, the opposition to the use of the shared Amateur bands by the Amateur Satellite Service, can be ascribed to genuine fears of harmful interference, but no doubt there are many other reasons that influenced those countries that opposed the Amateur position. "It Seems To Us" in "QST" of August 1971 puts the matter very clearly: "In the first weeks of the Conference it became apparent that a number of societies in other countries had not done their 'homework' of liaison with authorities."

The fact that at the last Plenary Meeting, the footnote I have quoted above in relation to the segment 435-438 MHz., was inserted into the frequency table, may result, one ventures to suggest, in many administrations giving special scrutiny to the Amateur Service. In addition, other services which failed to achieve anything at all, or at best very little, such as the Maritime Service, which failed totally to secure any frequencies for space communications, may likewise decide to carefully examine the position of the Amateur Service.

In my view, the Amateur Service over the next few years, could face a questioning of its position and perhaps its very existence, by a number of administrations and other services. It is clear that the Amateur Service as a whole must be able to demonstrate the usefulness to which it puts its frequencies. This, in itself is a complete justification for the Wireless Institute of Australia continuing to foster activities such as Project Australis.

Furthermore, the irresponsible use by any Amateur of the frequencies allocated to the Amateur Service cannot be other than detrimental to the whole service in respect of its allocations and privileges. The final results of the Conference may be less than we sought but were the minimum for which we hoped. The result also may be that the Amateur Service will, in the eyes of many, be on trial. Each of us, by our support of those activities that are truly useful, and by the responsible use of our privileges, can ensure that we do not place the future in jeopardy.

MICHAEL J. OWEN,
Federal President, W.I.A.

(Also refer to page 9 of September "A.R." for previous details.—Ed.)

DRAKE 2-B RECEIVER ON TOP BAND*

NOTES ON A SIMPLE MODIFICATION

R. L. GLAISHER, G6LX

The Drake 2-B was first introduced in 1959 and although it has been superseded by later models, in the writer's view it is still one of the best of the post-war Amateur receivers for s.s.b. and c.w. use. In addition to coverage of the 3.5 to 28 MHz. Amateur bands, it has a built-in facility which permits, with the use of extra crystals, reception on five extra bands each 600 KHz. wide anywhere in the range 3 to 32 MHz. It is this facility which can be used

mer. At first sight it might be thought that the addition of such a large capacity in shunt with the condensers already in circuit would have detrimental effects of the Q of the tuned circuits in the r.f. stage. In practice this was not found to be a problem as the pre-selector can be tuned over the frequency range required and more than sufficient gain is available from the r.f. stage to blanket the noise from the succeeding mixer stages.

are no obvious spurious or second channel signals within the 1.8 to 2.0 MHz. band. It is suggested that a crystal having an exact multiple of 100 KHz. be used as this will provide a direct frequency read-out on the main tuning scale.

PRE-SELECTOR MODIFICATION

It is first necessary to identify the two switch wafers that are associated with the pre-selector input and output circuits and the connections to the wafers that correspond to switch positions "A" and "80". These wafers are the first two looking from the front panel and as wired have a linking lead between the connections for "A" and "80" (see Fig. 2A). The modification consists of removing these leads and wiring in the padding condensers (C1A, CT1A, C2A and CT2A) as shown in Fig. 2B. While there is sufficient room to mount the extra components on short brackets attached to the chassis, this

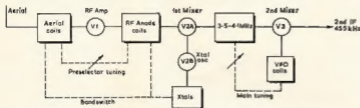


Fig. 1—Block diagram of the Drake 2-B Receiver, showing r.f. and mixer arrangements—see text.

to extend the coverage to include the 160 metre band.

As will be seen by reference to the block diagram (Fig. 1), the receiver is a multiple-conversion superhet, having a basic tuning range of 3.5 to 4.1 MHz. A crystal oscillator and mixer stage is switched into circuit for the Amateur bands 7 to 28 MHz. and for the five extra bands in the spectrum above 4.1 MHz. The grid and anode circuits of the r.f. stage are tuned independently of the main frequency control by the use of a separate pre-selector control comprising L/C circuits which resonate at 7 MHz. \pm 2 MHz. Coverage of the other bands and frequencies is obtained by the switching of capacitive or inductive shunts across the pre-selector coils to raise or lower their inductance.

To receive 160 metres, triple-conversion is used, as on the 7 to 28 MHz. bands. As the pre-selector circuits will only tune down to 3.3 MHz., it is necessary to add capacity so that they will resonate at 1.8 MHz. at mid-scale of the pre-selector tuning. This can be done by using the extra band "A" switch position to bring in capacitive shunts, which in conjunction with a suitable crystal fitted in the "A" socket, will provide the coverage required. By using band "A", the modification has no effect on the performance or the operation of the receiver on the other bands, as the shunts are only in circuit on 160 metres.

A total padding capacity of about 1500 pF. is required across each section of the pre-selector tuned circuits. This capacity is made up of a 0.001 μ F. silver mica condenser in parallel with a 700 pF. compression-type mica trim-

CRYSTAL FREQUENCY

To convert the 1.8 to 2.0 MHz. signal frequency to fall within the range of the tunable i.f. (3.5 to 4.1 MHz.), the crystal oscillator has to operate between 1.7 and 2.1 MHz. for product mixing, or between 5.5 to 5.9 MHz. for difference mixing. At G6LX, a crystal frequency of 5.5 MHz. is used to obtain a coverage of 1.8 to 2.0 MHz. with the receiver tuned 3.7 to 3.5 MHz. Product mixing is not recommended, as apart from the problem of the oscillator being in the band in the 1.8 to 2.0 MHz. segment, there are difficulties with strong second-channel signals and in-band birds. Using difference mixing, there

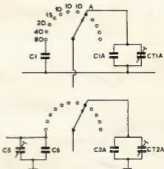


Fig. 2B—The preselector modifications for Top Band in the Drake 2-B. C1A, C2A are 0.001 μ F. silver mica. CT1A, CT2A 700 pF. compression-type trimmers—see text.

was not found to be necessary and the condensers were found to be necessary and were wired directly between the switch contacts and the 80 metre shunts using short lengths of 18 gauge tinned copper wire. If brackets are used, it should be remembered that most types of compression trimmers are constructed so that one side is at earth potential and insulated spacers will be required between the trimmers and the mounting brackets.

ALIGNMENT

Once the pre-selector modifications have been completed and a crystal of the correct frequency inserted into crystal socket "A", the only thing that remains is to adjust the trimmers CT1A and CT2A in order to resonate the pre-selector tuned circuits to 160 metres. This is a very simple adjustment which can be done without the use of a signal generator or other test equipment.

(Continued on Page 9)

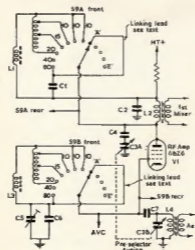


Fig. 2A—Part of the r.f. stage circuit of the Drake 2-B before modification. Component values are as original—see handbook.

* Reprinted from "The Short Wave Magazine," March, 1971.

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Page 5

output. A separate meter is used to indicate plate current of the power amplifier.

9 MHz. CARRIER OSCILLATOR

This unit consists of a series mode transistor oscillator and FET source follower. Diode switching allows the correct crystal to be selected when changing from normal to reverse sideband.

A.G.C.

The a.g.c. system uses a negative voltage derived from a voltage doubler and feeds in turn to the r.f. and first i.f. amplifiers, both units being dual gate FETs. This allows a large dynamic range prior to receiver overload and in actual practice the receiver will accept a signal from noise level to almost one volt before overload occurs.

10 VOLT POWER REGULATOR

The 10 volt power regulator supplies power to all stages of the transceiver with the exception of the audio output stage, transmitter p.a. and broad-band driver.

The supply consists of a two-stage emitter follower with short circuit protection following from a zener referenced voltage.

400 WATT POWER AMPLIFIER

The power amplifier consists of a 6L1060 u.h.f. dual tetrode transmitting tube. This stage has a broad-band input and pi-coupler output. The valve is running approximately 800 watts p.e.p. in and delivering 400 watts p.e.p. out.

The power is slightly less on 10 metres. Approximately 1,800 volt (p.a.) and 400 volt (screen) supplies are used.

R.F. AMPLIFIER

This is a band switched r.f. amplifier consisting of a dual gate FET followed by an emitter follower. Tuning is electronically accomplished using diodes. The r.f. amplifier is used both on transmit and receive.

BALANCED MIXER -MODULATOR

One of the most interesting blocks in the transceiver is an integrated circuit balanced mixer which performs the dual function of receive balanced mixer and transmitter balanced modulator. While receiving, the input ports are connected to the r.f. amplifier and the injection balanced mixer. The output of the balanced mixer is fed via an emitter follower to the 9 MHz. crystal filter. On transmit, the input ports are changed over and the transmitter audio is fed to one port and the 9 MHz. carrier to the other. The unit then functions as a balanced modulator. The carrier suppression of the balanced modulator and filter combined is in the vicinity of 60 dB.

9 MHz. 8-POLE CRYSTAL FILTER

A 9 MHz. 8-pole crystal filter is used with a bandwidth of approximately 2.5 KHz. at the 6 dB. points, rising to only 4.1 KHz. at the 60 dB. points.

I.F. AMPLIFIERS

The first i.f. amplifier is used both on transmit and receive and consists

of a dual gate FET. It has a g.c. applied on receive and a.l.c. on transmit.

The second i.f. amplifier also consists of a dual gate FET.

A.M./S.S.B. DETECTOR

The product detector used is a diode bridge detector and one leg of the bridge is opened when operating in the a.m. mode. A source follower connected to the output reduces the impedance to drive the audio amplifier, via the volume control.

THREE-WATT AUDIO AMPLIFIER

The three-watt amplifier consists of a pair of TO3 transistors, transformer coupled to the loudspeaker and driven by two small signal transistors.

TEN-WATT BROAD-BAND DRIVER

The 10-watt broad-band driver consists of a transformer coupled pair of v.h.f. strip-line transistors. These are driven by a single v.h.f. strip-line transistor. The complete unit is broad-band, from input to output, delivering approximately ten watts of drive to the power amplifier. This unit is contained on a separate circuit board mounted on a heat sink and does not require tuning.

V.F.O. 6-5 MHz.

The v.f.o. consists of a permeability tuned FET Vackar oscillator followed by suitable buffering stages. The unit is completely enclosed in a metal box and is substantially free from vibration, making it particularly suitable for mobile use.



INJECTION BALANCED MIXER

The injection balanced mixer is once again an integrated circuit similar to the type used in the balance modulator. The input ports are connected to the 6-5 MHz. v.f.o. and the band-set crystal oscillator. The output of this is fed via broad-band tuned circuits (to reduce the possibility of spots on receive) to an emitter follower driving both the receive and transmit mixers.

CRYSTAL OSCILLATOR

This unit is a series overtone crystal oscillator followed by a FET source follower. The appropriate crystals being switched in when changing from band to band.

DIGITAL SYSTEM

As the v.f.o. is reverse tuning from 6 to 5 MHz., a balanced mixer is used to convert this to the 2 to 3 MHz. range. This is then applied to a conventional

frequency counter. The 8 MHz. crystal used in the digital oscillator is diode switched when changing from upper to lower sideband and in some cases when changing from band to band (depending on whether additive or subtractive mixing is used). This is achieved automatically due to the logic system, enabling the digital readout to display the exact carrier frequency, rather than the centre pass band frequency.

FREQUENCY COUNTER

The frequency counter consists of eleven dual in line integrated circuits comprising complete count and memory facilities and it drives a three-digit seven-segment gallium arsenide display. It has the facility to scale down and read to one extra digit (100 Hz.).

LOGIC GENERATOR

The logic generator performs the functions necessary to generate the var-

ious gate, set and re-set pulses, etc., for the frequency counter. It also generates tones for c.w. transmission and tuning purposes. Eight dual in line integrated circuits and two transistors are used in this section.

100 KHz. CLOCK OSCILLATOR

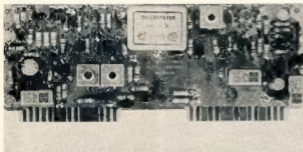
The 100 KHz. clock oscillator consists of a parallel mode 100 KHz. crystal. Twenty-one integrated circuits, five transistors and one FET are used in the complete digital readout system.

P.A. TUNING

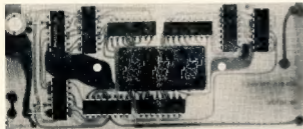
Before describing the tune-up system employed in the SSB-400, some comments are necessary on the tuning of s.s.b. transmitters in general.

It is a well known fact that an s.s.b. transmitter must be tuned at the full rated (p.e.p. value) input that it will be operating at on voice peaks in order

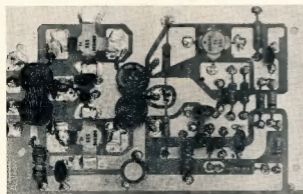
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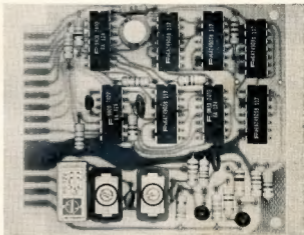
I.F. Modem.



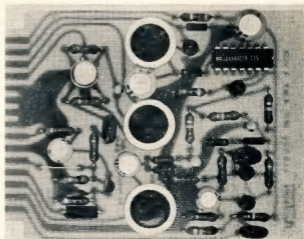
Frequency Counter and Digital Display Module.



10 Watt Broad-band Driver Module.



100 KHz. Clock Oscillator and Logic Generator module.



Microphone Amplifier, Vox/Anti-Vox Module.

A Tester for Field Effect Transistors*

A. G. THORBURN, G3WB7

The winter constructional programme at G3WB7 included, for the first time, quite a few projects using field effect transistors, but because of a lack of knowledge and a lack of data on these devices, this FET tester was designed, constructed and found satisfactory in operation. This design is not the last word in FET testers, as simplicity and availability of parts in the stock (junk) box were important influences.

The design of such a tester should enable FET transfer characteristics to be ascertained so as to allow correct bias points to be determined and load lines drawn. From these, some understanding of FETs would be obtained and circuits using them could be laid out for efficient and effective use.

Further criteria of the design were ability to check N and P channel junction FETs, MOSFETs or IGFETs; depletion or enhancement modes, and the ability to attach the FET easily to the tester and accommodate the multiplicity of different orders of drain, source and gate connections.

THE CIRCUIT

Fig. 1 shows the circuit diagram, and Fig. 2 shows the front panel layout. The latter has three crocodile clips, not shown in the circuit diagram, to which the FET leads are attached; the correct connections for drain, source and gate being arrived at by insertion of the three miniature wander plugs in the appropriate sockets.

* Reprinted from "Radio Comm.," July 1971.

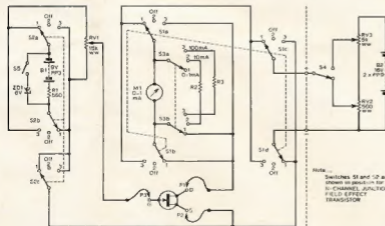


Fig. 1—Tester circuit diagram. Switches S1 and S2 shown in position for "N" channel junction FET.

ZD1—6v. zener diode, Mullard BZY88-C6V2, AEI-Lite2 or similar.
R1—500 ohm carbon.
R2—Meter shunt to suit 10 mA, f.s.d.
R3—Meter shunt to suit 100 mA, f.s.d.
RV1—15k ohm wire wound potentiometer (can be 20K or 25K ohm).
RV2—500 ohm wire wound potentiometer.
P1, 2, 3—Radio Spares miniature plugs and sockets (wander type).

Switch positions in the circuit diagram are shown for N channel junction FETs where the drain has positive polarity and the gate is negatively biased from 0v. to -6v. by means of RV1 with the 6v. zener in circuit, or to 9v. with S5 open. S5 must be open when the tester is not in use otherwise the 9v. PP3 will take current through the zener and R1 despite S2 being in the off position.

RV1 can be of very high resistance, as the gate, being reversed biased, takes no measurable current. S5 closed also allows RV1 to be calibrated in volts, 0 to 6, so no meter is required to read gate volts. When S5 is open the full 9v. is available if required. With enhancement mode MOSFETs or IGFETs there may be no drain current until application of gate volts bias.

For N channel MOSFETs with drain positive, the gate will be positive, the drain current increasing with increased positive bias. P channel MOSFETs require negative bias for current flow.

Depletion mode MOSFETs have current flow with zero bias, the N channel type decreasing drain current with negative bias and increasing drain current with positive bias. In this way depletion mode MOSFETs can operate from zero bias on application of either positive or negative bias, i.e. from zero bias a change either way changes drain current. The B1 switching takes care of all these possibilities in conjunction with RV1.

In the model shown, B1 is external to the tester, as is the separate a.c. p.s.u.

Fig. 1 shows B2 as 18v. from two PP9 or RH6 batteries in series. B2 and components to the right of the chain line in Fig. 1 can be built as a separate item as an alternative to the a.c. p.s.u.

OPERATION

To operate, all switches should be off and the wander plug positions checked that they are correct for the FET to be tested. S4 should be switched to the 500 ohm RV2 position, which should give 1.8v. maximum with an 18v. battery, and with a 30v. p.s.u. 3 v. maximum. For a junction FET, RV1 can be set half way and S3 meter switch

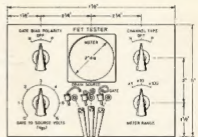


Fig. 2—Front panel layout.

to 100 mA. For IGFETs a finger should be held across the gate and source crocodile clips to prevent any build-up of static until the bias is switched on. Switch on S2 before S1 so that bias is applied before drain-source volts. Increasing bias on junction FETs decreases drain current. The meter switch should of course be moved to ensure that some drain current is showing.

Manipulation of RV1, RV2 and RV3 in conjunction with S4, using the station multimeter to read drain to source voltage and tabulating drain current against drain to source volts at known gate to source bias volts, allows the FET's transfer characteristics to be plotted and curves filled in.

Fig. 3 shows results obtained on an N channel general purpose FET.

While 18v. should be all that is necessary for B2, as components were available in the junk box a variable p.s.u., 0-30v., Fig. 4, was made up. The

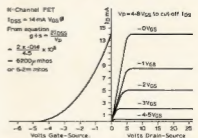


Fig. 3—Transfer characteristics of N channel general purpose FET.

transformer was an ex-radio speaker output transformer for 15 ohm output. The 500 μ F capacitor is mainly to allow peak voltage to build up. Fig. 5 shows the voltage drop against current taken for this p.s.u., and is included as a matter of interest for those contemplating a similar type of p.s.u.

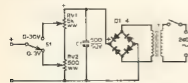


Fig 4—3-30v p.s.u. circuit diagram

C1—500 μ F
RV1—50 ohm wire wound potentiometer
RV2—50 ohm wire wound potentiometer
RV3—50 ohm wire wound potentiometer
S1—Single-pole, 2-way
D1—75V p.i.v. silicon rectifier diodes
T1—25V miniature transformer (Radio Spares).
Terminals or sockets—2 on

CONSTRUCTION

The tester shown is constructed in a 1" wall wooden box with a 1" thick paxoline panel. After marking out and drilling, a sheet of substantial plain white paper is placed over the finished drilled panel and all holes rubbed in. Hole centres are easily found to allow the paper to be marked up, using a suitable pair of compasses and pen for all necessary inscriptions. The panel is then lightly gummed and the paper placed in position. After allowing a period for drying out, the author used 2" wide Sellotape to cover the papered panel and wrap a little around the edges. The large holes can be cut radially before folding inwards and the small holes pierced with pen or pencil.

Assembly of the switches, variable resistors, etc., can then take place, the Sellotape protecting the panel while wiring and soldering takes place. RV1 is a linear wire wound potentiometer and the panel can be pre-marked 0 to 6v, as the input resistance is constant. It is advisable to subdivide the 0 to 1 division into either 10 or 5 further divisions.

It is not possible to divide out the sweep of RV2 and RV3 as the load here is not constant, as can be seen by Fig. 5, which, in a way, simulates the varying load presented by the FET drain current. The station multimeter across B2 input to the tester when in use shows this up as widely varying voltages at identical positions of RV3

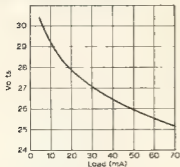


Fig 5—P.s.u. voltage drop against load in mA

DRAKE 2-B RECEIVER

(Continued from Page 3)

The receiver bandwidth is set to 160 metres (band "A") and the pre-selector control to mid-scale. The main tuning control is set to the frequency that corresponds to 1.9 MHz and the trimmers CT1A and CT2A carefully adjusted for maximum received noise without an aerial connected. If the receiver is fitted with the optional 100 KHz calibrator, this can be switched on and the trimmers adjusted for maximum S meter reading

Correct adjustment of the trimmers can be checked by retuning to 1.8 MHz and the pre-selector control adjusted for a noise peak (or maximum S meter reading on the calibrator signal). This peak should occur with the pre-selector at near maximum capacity (pre-selector dial near 3.5). A similar check at 2.0 MHz should provide a pre-selector peak at near minimum capacity (28 MHz. on the dial). Provided that the trimmers have been correctly set, tracking over the band will be satisfactory and the aerial can be connected. If it is found that the pre-selector will not peak at the band edges, or if there is an obvious difference in sensitivity over the band, this is a sure indication that the trimmers were not set correctly at 1.9 MHz, and further adjustment is required.

PERFORMANCE

A number of Drake 2-B receivers have been similarly modified for 160 metres, using the arrangement described. In every case the sensitivity throughout the band has compared favourably with that obtainable on 80 metres. The G6LX receiver has been used extensively for Top Band DX working and has the Croydon N.F.D. Group, with excellent results



OVERSEAS MAGAZINE INDEX

This month five magazines were available to us: 1. "Break-In, July 2. "CQ," Sept. 3. "QST," July 4. "Radio Communication, August, 5. "Short-Wave Magazine, July (all 1971 issues). Material available, varied, as usual, with the accent upon antennas.

Antennas: An optimum performance array for 160, 40 and 20 metres; A half-wave DDR Antenna; An Antenna for 25 metre WAB; The KROCO Modified HT-18 Fly-Tower; A Rotatable Dipole for 80, 40 and 20 metres; A Cheap 10 metre Vertical, see key 1; The Ground Image Vertical Antenna (B3); "Two-Toler" Lightweight Portable Beam for 2 metres (B3); Development of an All-Band Vertical (4)

Accessories: A Simple IC Keyer with weight control (3); Katami CW Monitor and Electronic Keyer, review (8)

General: A Second Look at Linear Integrated Circuits (3); A 20 MHz Digital Frequency Meter using TTL ICs, Part 2 (4); Microwave Diodes (4); Modern Filter Design for the Radio Amateur (4); The Solar Link (Amateur Radio Astronomy) (4)

Steering: A Solid State Noise Blanker (3); A Tunable 449 MHz FM Receiver (3); Heath Model SS-203 Receiver, review (3); An RF Noise Bridge and its uses (3); More about Satellite Reception, Part 2 (3)

Transmitting: A Power Bridge and SWR Indicator for 2 metres (3)

Other: Standard Frequency and Time Transmissions (1); Space Conference Interim Report (2).

VK3ASC

ACITRON SSB-400

(Continued from Page 1)

to obtain the maximum output consistent with the best linearity. For example, if a transmitter is operated at 400 watts p.e.p. r.f. output it can only be correctly adjusted when running at this level. If it is tuned up at a value below this level and the drive is then increased to full input, it will be substantially maltreated and most certainly not optimised for best linearity

In order to meet the above, the following requirements have to be met:

- (a) A power supply capable of running with a continual two-tone input at the full p.e.p. rating, with little or no voltage drop;
- (b) A p.a. tube or tubes capable of standing the full p.e.p. rating for some time

However, in practice allowing for 50% transmit/50% receive time, the actual duty cycle on speech wave forms is as little as 15% to 20%.

In summarising, it is sufficient to say that for normal operation of s.s.b. equipment, i.e. voice, we require valve and power supply capabilities far in excess of what is necessary simply to enable the transmitter to be correctly tuned

The novel (patented) tune-up system employed in the SSB-400 overcomes this problem using a different technique. The system of tuning is accomplished by feeding a low-duty cycle wave form into the transmitter audio input. In practice, this consists of a tone burst, with a one to ten mark to space ratio, meaning that the transmitter is running during these bursts to its full rated input, but is only running an average power in the order of 10% of its maximum rating

This in effect means that although the transmitter is running to its full rated p.e.p. input there is only one-tenth of the drain on both power supply and p.a. tube. This enables the operator to be relatively slow in carrying out the tune-up procedure and still have little possibility of damaging the final valve

The price of the SSB-400 transceiver is \$750.



HY-Q ELECTRONICS TO MANUFACTURE IN SINGAPORE

Hy-Q Electronics Pty Ltd, the Melbourne based quartz crystal manufacturers whose Frankston, Vic., plant is now operating at capacity, are to start manufacturing in Singapore

Mr T. A. Dineen, marketing director of Hy-Q, stated on his return from Singapore that the new operation Hy-Q Electronics International Pty. Ltd. will be in production early in 1972 and that a new air-conditioned factory is already under construction

Hy-Q Electronics will be joined in this venture by O'Connor Pty. Ltd., a Singapore based organisation with a 30% holding in the new company

Mr Dineen recently carried out a survey of East Asian markets, and with Mr P. E. Cooper, chairman of Hy-Q Electronics, and Mr. R. C. Richards, managing director, concluded the negotiations with O'Connor and the Singapore Government.

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Sansel Mini-Bridge, 2 kw.	\$8 plus tax
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Linear Amplifier G.G. Ferrite Filament Choke FL15	\$10 plus tax
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AMATEUR RADIO CO-OPERATION—YB STYLE

HOWARD RIDER,* VK3ZJY

To a modern reasonably equipped Radio Amateur with his commercially built a.s.b. transceiver, cubical quad, monitoring scope, etc., moving through Indonesia is like turning back the pages of history. With very, very few exceptions no such sophisticated equipment will be found, nor even the components out of which such gear can be built.

Valves such as 6V6s, 6L6s, EL34s and 807s form the vast majority of final r.f. amplifiers and modulators, whilst antennas are nearly all of the single wire feed types (inverted L, Windom, etc.). I have only seen two folded dipoles, both manufactured from t.v. ribbon. Co-axial cable is a term read in the very few available magazines.

The few home-brew a.s.b. units I have viewed are pieces of art and reflect the ingenuity of the builders. For example, the Australian Amateur can purchase a crystal filter or p.s.n. from any one of a number of sources. His Indonesian counterpart, however, not only does not have this facility, but could not afford it. The cost would represent more than one month's, and in some cases more than two months, wages (I am assuming the price to be around \$9.00).

Following my meetings in Djakarta (Region 0), my work took me to Bogor, a township some 70 kms. distant (Region 1). Here I was very fortunate as my counterpart at the University was Soedarsono, himself a Radio Amateur (YDIPY). Being a member of the local group, he swiftly arranged an informal meeting. Present were: Sofjan Wahab (YBIFX), President; Atje Dimijati (YDIPX), Secretary; Mardijanto (YCFD), M. Ali Nuriawan (YDIGA), David Djoenemo (YDIGB), John Murdock (YBIAAK/WA8LRL), Soedarsono (YDIPY) and myself.

After a long general discussion it was decided to hold a public display of equipment and operation techniques on 17th August which is Indonesian Independence Day, perhaps the most important national holiday of the year.

There was to be a general exhibition in a very large hall in Bogor and permission would be sought for display area. If gained, the exhibition would be a milestone, one of the first of its kind ever held in Indonesia.

My presence was politely but firmly requested and even although at the time I would be working in Denpasar, Bali, over 1,000 miles away, it was agreed that I fly back and put in an appearance. Living in the area, John Murdock would naturally come and he offered whatever help he could give.

There was more to this display than appeared on the surface as I was later to find out—it was only the incentive to start that was needed.

For many reasons that are generally known, Amateur Radio in Indonesia is very young, actually just a little over

three years old. It is up to about the same stage that existed in Australia in the late 1930s. The old timers will remember those days as ones in which individuals, usually Amateurs, were transmitting regular programmes both on the broadcast and lower short wave bands.

That is the position that exists in Indonesia now. There are two main divisions (a) Radio Amateurs licensed by the government to operate on Amateur frequencies and within the framework of International Amateur Radio Regulations; they issue three classes of licence depending upon the examinable knowledge reached by the Amateur, and (b) Broadcast station licences issued by the government to operate within the broadcast and lower short wave bands; there are two licences depending upon the experience and qualities reached, but knowledge of radio is not a pre-requisite.

Unfortunately there are many unlicensed broadcast stations—policing the regulations is very difficult because of staffing and equipment problems. It is a slow process weeding out the unlicensed, but it is being undertaken and gathering momentum as finance and personnel become available.

I have seen a number of broadcast stations, most of which range between 60 and 100 watts input and have 807s in the final. Some are of good quality, others are very poor but all fill a need which is to give the local population some form of entertainment to listen to.

The general population, however, do not realise that there is a difference between the true Amateur and a broadcast station, to them they are one and the same. Many problems occur particularly because of the extremely limited radio knowledge of the broadcaster. Distortion and harmonic radiation in some areas create "birdies" and heterodynes all over the dial. Of course, the Amateur gets the blame.

Education of the public in this field was thus a further reason for the proposed display at Bogor. When this was first explained to me, I was a little incredulous, but now having travelled extensively throughout Indonesia, I fully agree with all that was said.

A further meeting was held three days later (Tuesday, 13th July) at which it was decided that the display would be completely Indonesian in gear—all home-built and transmissions would take place in the 3.5 MHz. band. A letter was despatched to the Hall Committee requesting available space.

The following day I began my tour which took me over 1,000 miles to the east of Bogor. I was very surprised to find how effectively the grapevine operated.

Amateurs in Jogjakarta and Surabaya not only knew of the proposal but were watching the outcome with great interest. It became obvious to me that

if successful, many other such exhibitions would be held the following year in other regions. If unsuccessful, it would be a bitter blow to the Amateur fraternity.

As promised I flew back from Bali and arrived in Bogor during the afternoon of 16th August. Things had not gone well and little had been done because no reply had been received from the Hall Committee up to 1800 hours on 16th.

When I told of the general interest shown, the President (Sofjan), Soedarsono and I went to see the organiser and space allocation committee. Valid reasons were given for no allocation, but by this time Sofjan was adamant and determined.

Things began to move. By 8 p.m. we had space, 9 p.m. we had tables and other Amateurs came to help. 10 p.m. we had display posters beautifully drawn, mostly in caricature by Aljo (Secretary). 11 p.m. we had the antenna erected—a half wave dipole on 3.5 MHz. At midnight we had gathered some components and equipment for display. After laying out where everything would go the next day, we all left the hall at 0100, all very tired but satisfied.

At 0700 on the 17th we again met at the hall and began organising power, display boards, literature to be printed and distributed to interested spectators, covering of tables, etc. By this time there were Amateurs everywhere, all doing their respective parts. I don't remember anyone having breakfast or lunch as it was a race against time—the exhibition was to be opened by the Governor at 1600 hours.

Somehow it was done and the result? One of the most colourful and most visited displays at the exhibition. Even the Governor made special mention at the opening.

It will carry on until 24th August and a timetable was drawn up always to have someone in attendance to take and answer the many numerous enquiries from people in all walks of life. The name given to the stand "Expo Orari" (Organisation of Radio Amateurs of the Republic of Indonesia) was very apt.

For me personally the whole operation had a deeper meaning. I was an Australian working in a foreign country—but in this case I was not accepted as a foreigner. I was an Amateur regardless of race, creed or colour and no special compensations were given. My hands got just as dirty as theirs in trying to overcome the many problems that arose.

Late that night I said a temporary goodbye to all concerned because I was expected many miles away the following morning to begin my work. However, I shall always remember that day and a half at Bogor where I played a very small part and saw the true Amateur co-operative spirit at its very best.

* 233 Cumberland Road, Pascoe Vale, Vic., 3046



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A TABLE OF DISTANCES BETWEEN AUSTRALASIAN V.H.F. LOCATIONS

DEREK BRUMLEY,* VK3AVW

It has long been felt that a table of distances between some of the most popular v.h.f. locations in Australasia would be very useful. Three applications come especially to mind.

- (1) The compilation of field day and contest logs, where scoring is dependent on the distance covered,
- (2) The planning of possible paths for attempts at distance records, and
- (3) Calculation of path loss for scatter circuits.

Small distances may be obtained fairly accurately by reading directly off a map, but above a few hundred miles it becomes necessary to calculate the great circle distance between the points of interest. This is a long and tedious process if done manually, but fortunately it is well within the capabilities of the modern digital computer.

A programme has been developed which calculates the angle subtended at the earth's centre by any two points on the earth's surface, given their latitudes and longitudes. This is then multiplied by the earth's radius to give the required great circle distance.

The programme makes allowance for the difference between the polar and equatorial radii of the earth by using the latitudes of each pair of locations to calculate an "average" radius for each path. Although this is only a first order correction, it is sufficient for the present application. The accuracy of distances in the table is limited by that of the latitudes and longitudes which were taken to the nearest minute of arc.

Those within Victoria were obtained from survey maps; the rest were found from the "Times World Index". The computer calculates the distances to several significant figures, but rounds them off to the nearest integer before printing.

No apologies are offered for the choice of locations. It was hard enough to restrict the number to sixty, but any increase would have made the table prohibitively large.

The table appears on pages 14 and 15

* 23 Paversham Rd., Canterbury, Vic., 5138.

This month there are no
local Technical Articles.

WHY?

We have the Articles,
but few Draughtsmen.

CAN YOU HELP US?

VK3 or Interstate aid welcome

John Moyle Memorial National Field Day Contest, 1972

SATURDAY, 12th FEBRUARY, TO SUNDAY, 13th FEBRUARY, 1972

The Federal Contest Committee of the Wireless Institute of Australia invites all Australian Amateurs and Short Wave Listeners to participate in this Annual Contest, which is held to perpetuate the memory of John Moyle, whose efforts advanced the Amateur Radio Service.

There are two divisions of this Contest, one of 24 hours continuous duration, and one of 6 hours continuous duration. The six-hour period has been included to encourage the operator who is unable to participate for the full 24-hour period. The 24-hour continuous operation is to be chosen by an operator from the 28-hour period.

An operator using 25 watts or less input to the final stage will be considered for a certificate where his activity warrants its issue.

DATE

From 0800 GMT, 12th February, 1972, to 0800 GMT, 13th February, 1972.

OBJECTS

The operators of Portable and Mobile Stations within all VK Call Areas will endeavour to contact other Portable/Mobile and Fixed Stations in VK Call Areas and Foreign Call Areas.

RULES

1. There are two divisions, one of six (6) hours, and one of twenty-four (24) hours duration. The six-hour period for operating may be chosen from any time during the Contest, but the six-hour period so chosen must be continuous. In each division, there are six sections:—

- Portable/Mobile Transmitting, Phone.
- Portable/Mobile Transmitting, C.w.
- Portable/Mobile Transmitting, Open.
- Portable/Mobile Transmitting, Multiple Operation, open only.
- Fixed Transmitting Stations working Portable/Mobile Stations, open only.
- Reception of Portable/Mobile Stations.

2. All Australian Amateurs are encouraged to take part. Operators will be limited to their licensed power. For Portable entries, power shall be derived from a self-contained and fully portable source.

(a) Portable/Mobile Stations shall not be situated in any occupied dwelling or building. Portable/Mobile Stations may be moved from place to place during the Contest.

No apparatus shall be set up on the site earlier than 24 hours prior to the Contest.

All Amateur bands may be used, but no cross band operating is permitted. Cross mode operation is permitted.

Entrants in Section (d) for Multiple Operator Stations can set up separate transmitters to work on different bands

at the same time. All such units of a Multiple Operator Station must be located within an area that can be encompassed by a circle not greater than half a mile diameter.

For each transmitter of a Multiple Operator Station a separate log shall be kept with serial numbers starting from 001, and increasing by one for each successive contact. All logs of a Multiple Operator Station shall be submitted by the operator under whose Call Sign the transmitters are working. No two transmitters of a Multiple Operator Station are permitted to operate on the same band at any time.

3. Amateurs may enter for any section.

4. One contact per station for phone to phone, also one for c.w. to c.w. per band is permitted. Cross mode operation will be accepted for scoring.

5. Entrants must operate within the terms of their licences and in particular observe the regulations with regards to portable operation.

6. For VK stations contacting VK stations, the exchange of serial numbers consisting of RS or RST report plus three figures commencing with 001 and increasing by one for each successive contact by the VK station shall be proof of contact. The exchange of RS or RST reports only with non-VK stations shall be sufficient proof of contact for this contest.

7. Scoring—

(a) Portable/Mobile Stations: For contacts with Portable/Mobile Stations outside entrant's Call Area 15 points

For contacts with Portable/Mobile Stations within entrant's Call Area 10 points

For contacts with Fixed Stations outside the entrant's Call Area 5 points

For contacts with Fixed Stations within the entrant's Call Area 2 points

(b) Fixed Stations: For contacts with Portable/Mobile Stations outside entrant's Call Area 15 points

For contacts with Portable/Mobile Stations within entrant's Call Area 10 points

Operation via active repeaters or translators is not allowed for scoring purposes.

Example of Victorian S.W.'s Log

Date Time (GMT)	Band (mhz)	Call	Sign	RST No. Sent	Station Worked	Pts. Cfm.
12/2/72						
0800	80	VK2AAH/P		59001	VK3ATL/P	15
0810	80	VK3ATL/P		59006	VK5GV	10
0820	40	VK2AAH/P		59004	VK5VE/P	15
0840	20	VK5GV		59019	VK5QX/P	5
0755	20	VK4OF/P		59040	VK4OX/P	15

* No claim Fixed Station.

8. The following shall constitute Call Areas: VK1, VK2, VK3, VK4, VK5, VK6, VK7, VK8, VK9 and VK0

9. All logs shall be set out under the following headings: Date/Time (G.M.T.), Band, Emission, Call Sign, RST/No. Sent, RST/No. Received, Points Claimed. Contacts must be listed in numerical order.

In addition, there shall be a front sheet showing the following information:—

Name Address
Call Sign Section
Division (6-hour or 24-hour)
Points Claimed
Call Sign of other op./s (if any)
Location of Portable/Mobile Station
From hours to hours

A brief description of equipment used, and points claimed, followed by the declaration:

"I hereby certify that I have operated in accordance with the rules and spirit of the Contest."

Signed Date

10. The right is reserved to disqualify any entrant who, during the Contest, has not observed the Regulations and the Rules of this Contest, or who has consistently departed from the accepted code of operating ethics.

11. The decision of the Federal Contest Manager of the Wireless Institute of Australia is final and no disputes will be entertained.

12. Certificates will be awarded to the highest scorer of each section of each 6 or 24-hour division. Additional certificates may be issued at the discretion of the F.C.C. The 6-hour certificates cannot be won by a 24-hour entrant.

13. Return of Logs: All entries must be postmarked not later than 8th March, 1972, and be clearly marked "John Moyle Memorial National Field Day Contest, 1972", and addressed to:

Federal Contest Manager, W.I.A.,
Box 838, G.P.O.,
Brisbane, Qld., 4001.

Written comments are invited from all contestants.

RECEIVING SECTION

14. This section is open to all Short Wave Listeners in VK Call Areas. The Rules shall be the same as for the Transmitting Stations, but may omit the serial numbers received.

Logs must show the Call Sign of the Portable/Mobile Station heard, the serial number sent by it, and the Call Sign of the Station being worked

Scoring will be on the same basis as for Transmitting Stations. It will not be sufficient to log a station calling CQ. A portable/mobile station may be logged once only for phone and once only for c.w. in each band.

Awards: A certificate will be awarded to the highest scorer of each of the 6-hour and the 24-hour divisions.

DISTANCES BETWEEN AUSTRALASIAN V.H.F. LOCATIONS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
1		36	136	361	131	235	511	223	127	326	150	208	110	233	297	297	320	290	404	399	253	368	305	446	247	174	762	690	740	1045	
2	36		111	362	151	214	235	460	155	301	170	321	410	307	268	270	324	283	377	373	226	345	324	451	252	144	781	622	770	1056	
3	136	111		672	207	110	626	233	230	440	364	435	231	136	154	173	201	167	269	265	152	240	159	311	144	83	559	756	843	1058	
4	361	362	672		236	621	154	365	242	78	536	68	273	691	605	645	673	623	611	726	612	710	631	757	605	960	524	529	397	817	
5	131	151	237	236		361	269	132	30	215	97	180	100	420	376	408	432	398	430	497	276	475	396	534	370	274	652	472	618	854	
6	235	214	110	521	301		674	459	265	914	770	662	343	153	82	179	325	197	185	319	303	314	161	237	203	94	842	741	612	1019	
7	511	460	237	154	130	674		399	265	130	374	302	110	67	789	628	787	725	491	703	664	765	811	757	602	323	126	880	75		
8	223	243	353	165	132	459	399		153	107	77	123	110	501	201	500	563	512	361	373	426	452	450	562	365	361	597	509	699	1035	
9	157	130	230	242	35	265	300	153		229	122	185	194	420	385	405	450	391	408	468	374	455	390	520	269	620	478	812	1118		
10	326	351	449	78	216	514	183	107	229		184	90	233	465	385	680	650	610	636	711	579	689	607	748	673	487	508	280	450	900	
11	150	130	264	326	97	370	375	77	122	184		184	20	482	435	447	461	440	517	543	400	512	456	563	393	329	663	471	633	1001	
12	306	321	435	184	130	462	313	153	85	104	375	321	414	215	647	789	825	805	688	556	652	574	699	550	450	469	387	443	1247		
13	115	140	251	373	130	565	414	114	134	220	38	328		448	404	411	446	405	494	515	263	482	450	562	365	361	597	509	699	1035	
14	353	307	168	681	430	153	815	651	420	645	665	605	448		80	80	49	54	332	67	146	68	73	118	163	165	565	568	1011	1118	
15	290	365	154	605	378	88	730	501	365	652	436	547	404	00		185	95	82	314	122	154	125	80	158	158	116	650	450	964	1108	
16	297	370	173	645	406	179	738	530	403	650	447	565	431	80	105		42	23	319	124	70	74	16	180	77	158	1008	878	1013	1148	
17	370	304	301	678	458	183	823	562	401	810	447	565	446	80	105	42		41	309	83	111	38	46	147	119	164	1021	923	1034	1148	
18	454	387	308	811	430	185	755	651	440	630	471	565	440	253	214	319	300	308		373	368	315	304	347	309	121	897	894	965	1085	
19	390	372	308	726	497	213	681	617	446	711	548	608	615	87	123	134	83	118	372		194	84	135	85	901	329	1053	968	1074	1197	
20	233	228	152	813	376	362	703	478	274	879	605	556	363	146	134	70	111	83	389	194		139	74	358	8	129	980	848	961	1211	
21	358	342	240	710	478	218	964	590	448	688	818	653	463	89	135	74	38	70	316	84	139		83	120	147	1053	1087	941	1071	1228	
22	358	342	240	710	478	218	964	590	448	688	818	653	463	89	135	74	38	70	316	84	139		83	120	147	1053	1087	941	1071	1228	
23	445	421	311	787	504	237	911	859	520	748	560	608	563	118	156	123	147	170	247	95	226	136	127	980	848	961	1071	1228	1280	1380	
24	847	822	148	606	370	268	767	469	369	673	369	530	356	133	156	77	119	80	369	301	8	147	80	265		127	966	842	956	1210	
25	174	168	39	608	274	94	983	291	206	687	322	450	300	180	118	130	184	125	279	329	189	303	184	272	127		808	740	874	1062	
26	783	781	839	446	853	843	353	398	638	608	863	469	697	805	925	1005	1021	907	847	1053	990	1057	1068	1072	886	868		237	321	472	
27	390	392	452	705	328	907	411	605	823	607	671	322	508	888	823	978	903	869	908	923	648	941	903	877	843	874	307		175	715	
28	749	749	843	397	819	863	390	600	618	490	632	443	609	1013	954	1013	1024	1068	1074	861	1071	1068	1074	861	1071	861	861	861	861	861	
29	1045	1055	1080	817	934	1019	1048	958	818	898	1001	1027	1025	1158	1162	1168	1188	1178	1233	1187	1211	1236	1211	1236	1211	1088	1478	715	580		
30	770	590	675	310	442	711	89	350	445	369	444	363	481	837	798	646	672	634	771	921	816	910	833	946	815	708	304	31	108	713	
31	975	914	941	680	850	1027	988	828	645	740	890	697	923	1178	1118	1180	1208	1179	1088	1231	1182	1243	1181	1231	1180	1059	235	488	353	834	
32	941	904	766	881	813	773	105	688	655	817	745	606	564	119	185	917	941	903	899	908	1182	1179	903	1011	1183	778	320	48	130	885	
33	836	836	836	836	836	907	411	605	823	607	671	322	508	888	823	978	903	869	908	923	648	941	903	877	843	874	307		175	715	
34	858	860	697	305	439	698	118	360	429	270	460	251	477	834	776	639	653	814	737	897	600	689	814	919	797	890	360	70	192	675	
35	1132	1132	1187	840	999	1136	779	996	896	817	1002	863	1061	1283	1284	1212	1218	1291	1075	1238	1218	1249	1195	1214	1233	1187	427	684	587	804	
36	698	576	473	818	639	362	960	768	813	824	730	763	698	345	343	634	326	407	308	321	498	384	415	350	499	445	1032	1001	1079	1223	
37	473	448	341	742	535	238	1058	655	817	745	806	564	581	189	195	909	923	258	164	177	238	228	361	112	341	708	1267	1048	1048	1088	
38	914	687	717	810	700	907	411	605	823	607	671	322	508	888	823	978	903	869	908	923	648	941	903	877	843	874	307		175	715	
39	519	680	377	810	639	238	963	730	877	806	657	763	627	181	233	983	921	352	356	339	353	351	387	74	339	340	1094	1084	1130	1183	
40	496	471	380	802	360	281	954	707	606	796	842	749	611	109	207	307	190	329	264	113	307	174	237	51	814	322	1085	1018	1136	1184	
41	536	535	434	787	600	222	951	733	579	609	682	731	609	304	301	835	349	365	176	383	447	345	273	274	631	602	1005	975	1066	1093	
42	653	628	628	628	628	459	954	797	605	848	758	770	743	447	423	836	494	380	348	438	585	639	818	378	621	540	971	992	1040	924	
43	485	485	485	485	485	264	955	761	608	858	712	757	691	336	234	415	390	388	308	313	480	376	497	352	487	348	810	899	850	1035	
44	598	665	406	813	629	264	955	761	608	858	712	757	691	336	234	415	390	388	308	313	480	376	497	352	487	348	810	899	850	1035	
45	1708	1737	1630	1974	1898	1583	1511	1514	1780	2009	1891	1886	1887	1454	1680	1882	1841	1515	1379	1280	1562	1635	1522	1536	1500	1894	2001	2133	2169	1875	
46	2324	2324	2311	2344	2353	1997	1446	1556	2308	2390	2327	2308	2313	1974	1881	2023	2013	2038	1820	1934	2120	1908	2047	1967	2187	1890	2040	2305	2451	2491	1803
47	3053	3043	1943	2231	1990	1810	2334	2214	2008	2252	2177	2174	2010	1796	1813	1893	1834	1853	1641	1743	1924	1804	1887	1977	1941	1911	2234	2326	2335	1875	
48	1825	1851	1459	1713	1613	1477	1685	1749	1560	1766	1761	1711	1682	1384	1217	1738	1335	1384	1184	125											

DISTANCES BETWEEN AUSTRALASIAN V.H.F. LOCATIONS

	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
1	570	870	841	830	508	1122	506	472	914	533	486	556	892	443	558	1780	2224	2045	1582	1004	434	494	535	437	1217	1050	1474	1378	1332	1447
2	503	994	604	744	502	1135	570	446	896	488	471	525	635	495	568	1737	2205	2045	1581	1003	412	411	518	417	1211	1050	1450	1394	1352	1459
3	675	1041	644	860	657	1107	475	441	954	377	360	434	545	373	469	1830	2112	1942	1456	1798	344	352	472	369	1154	1025	1545	1455	1350	1492
4	510	668	301	501	302	840	818	743	1060	839	903	787	832	645	813	1979	2364	2321	1763	1213	795	704	880	794	1192	1835	1307	1461	1467	1607
5	442	505	513	700	429	959	630	535	937	563	540	600	668	510	824	1823	2235	2086	1513	1050	533	563	665	587	1167	1031	1440	1425	1339	1481
6	713	1077	777	997	868	1135	462	232	669	299	261	322	439	258	254	1535	1907	1830	1347	1485	284	394	534	422	1055	1833	1060	1069	1058	1455
7	80	348	151	453	110	770	960	892	1189	962	914	931	954	885	855	1201	1445	1354	1485	2235	944	944	1081	829	1203	1848	1390	1440	1507	1461
8	359	829	440	605	389	996	765	605	1054	720	797	728	797	641	781	1497	2360	2321	1743	1089	648	645	732	641	1260	1846	1331	1547	1337	1483
9	445	840	619	825	399	968	615	517	803	377	506	579	645	485	608	1787	2320	2025	1500	1527	644	606	671	571	1141	1846	1460	1450	1433	1508
10	289	749	378	172	370	917	834	745	1100	865	795	800	849	703	835	1892	2380	2325	1795	1164	791	758	856	748	1252	1810	1334	1348	1381	1413
11	444	890	515	731	442	1053	780	608	1090	851	642	683	598	597	713	1887	2317	2174	1718	1047	775	758	856	748	1252	1838	1344	1332	1312	1338
12	263	497	323	537	851	883	762	854	1017	875	743	721	770	670	737	1895	2302	2174	1713	1063	743	741	839	744	1106	1838	1420	1464	1463	1490
13	441	928	555	785	477	1081	684	581	1054	837	611	650	743	578	691	1887	2313	2180	1862	1038	632	639	671	526	1264	1831	1352	1320	1305	1335
14	857	1178	894	1058	824	1282	345	149	688	181	169	304	447	382	398	1454	1747	1789	1391	1633	305	280	411	318	1127	1822	1385	1561	1462	1504
15	799	1118	896	998	778	1234	343	146	683	223	207	301	432	388	354	1460	1981	1803	1317	1652	308	281	453	356	1090	1885	1581	1593	1491	1560
16	468	1190	917	1079	896	1512	434	969	757	263	237	383	528	387	415	1523	2053	1895	1378	1796	305	271	349	251	1189	1892	1523	1482	1429	1536
17	872	1259	941	1096	853	1218	389	253	731	221	199	349	494	341	389	1641	2013	1894	1333	1694	305	271	353	270	1175	1892	1504	1523	1482	1535
18	434	1119	903	1053	814	1291	467	353	750	253	239	385	500	340	389	1615	2035	1852	1304	1690	329	341	372	274	1179	1897	1533	1480	1421	1506
19	271	928	598	820	757	1075	508	354	810	256	254	178	348	40	302	1739	1890	1961	1184	1530	311	531	665	586	852	1971	1387	1754	1023	1859
20	521	1821	809	1116	897	1238	321	167	862	139	113	283	435	298	312	1380	1934	1743	1254	1583	282	279	407	323	1128	1829	1748	1597	1511	1706
21	818	1152	889	1097	803	1316	498	355	833	332	307	447	585	432	480	1392	2120	1934	1446	1749	198	203	335	324	1247	1828	1585	1516	1346	1513
22	610	1815	799	1131	899	1349	394	354	725	301	174	345	485	348	378	1455	1986	1804	1313	1641	209	221	331	320	1153	1832	1593	1526	1446	1543
23	823	1181	822	1054	814	1385	418	261	759	381	227	375	515	354	407	1553	2047	1852	1272	1784	228	234	368	287	1181	1878	1528	1459	1414	1481
24	946	1331	1011	1154	919	1518	280	113	966	74	81	224	378	353	256	1330	1867	1677	1184	1817	321	338	463	384	1077	1881	1811	1964	1377	1771
25	615	1188	853	1053	787	1513	495	361	838	339	314	453	591	427	456	1600	2127	1941	1453	1783	300	305	338	251	1251	1824	1546	1461	1354	1511
26	709	1085	778	934	890	1187	445	306	778	340	328	469	639	349	345	1594	2094	1911	1436	1764	325	331	455	352	1146	1828	1573	1478	1413	1684
27	284	328	830	68	240	477	1052	1067	1134	1084	1085	1095	971	869	1050	2081	2305	2234	1638	2170	1180	1158	1396	1197	1051	1736	1479	1637	1688	1693
28	31	458	68	513	70	684	1094	843	1205	1024	1010	979	962	886	997	2183	2435	2328	1894	2345	1053	1052	1126	1052	1219	1772	1474	1631	1693	1696
29	185	325	130	133	138	687	1079	1034	1228	1128	1128	1058	1060	1076	1116	2149	2444	2334	1892	2396	1181	1180	1328	1185	1187	1874	1528	1780	1770	1719
30	713	354	685	464	673	304	1093	1089	1033	1182	1184	1035	954	846	1035	1870	1855	1931	1509	1810	1462	1411	1537	1434	688	1064	1348	1371	1394	1395
31	—	488	71	524	67	691	971	917	1177	899	987	465	963	328	947	2105	2413	2232	1878	2228	1094	1020	1088	1064	1202	1788	1438	1566	1593	1693
32	409	—	647	178	475	204	1145	1162	1217	1253	1256	1128	1079	1036	1143	2121	2383	2231	1850	2184	1389	1389	1507	1408	983	1828	1584	1625	1691	1643
33	71	447	—	272	83	465	1026	973	1219	1098	1041	1062	1062	884	1032	2149	2436	2343	1891	2238	1149	1174	1169	1075	1211	1747	1463	1680	1644	1661
34	334	176	372	—	304	378	1075	1086	1183	1154	1186	1060	1019	863	1073	2119	2431	2355	1856	2181	1532	1525	1564	1084	1051	1768	1719	1480	1610	1671
35	47	678	82	504	—	983	959	1086	1134	994	959	910	913	805	851	2063	2358	2286	1828	2170	992	981	1080	995	1150	1747	1481	1568	1523	1605
36	891	204	945	575	653	—	1126	1336	1368	1330	1330	1195	1108	1090	1189	2104	2149	2125	1714	2114	1181	1318	1328	1558	898	1126	1688	2084	2325	2345
37	971	1145	1020	1070	935	1198	—	158	343	369	336	43	126	133	9	1172	1539	1603	1393	1358	831	949	732	844	828	1635	2017	1908	1827	2023
38	971	1182	973	1068	856	1306	156	—	480	83	997	118	368	146	147	1389	1708	1668	1121	1458	828	948	732	840	980	1770	1877	1750	1671	1651
39	1177	1817	1218	1329	1134	1208	345	480	—	535	854	364	352	428	352	951	1310	1190	887	1047	918	935	1083	981	986	1748	1843	2247	2170	2341
40	903	1253	1058	1154	904	1350	350	83	535	—	29	379	333	238	201	1363	1798	1680	1118	1643	811	808	1163	946	1082	1578	1583	1745	1584	1844
41	987	1255	1051	1156	906	1339	236	107	564	39	—	305	356	256	237	1389	1823	1630	1141	1408	528	371	440	418	1001	1818	1680	1707	1671	1817
42	945	1298	1009	1090	910	1196	43	118	364	379	303	—	158	138	33	1289	1661	1500	1086	1367	548	341	888	800	887	1685	1597	1503	1785	1931
43	953	1078	1032	1018	913	1108	138	288	263	333	356	155	—	171	133	1157	1872	1418	946	1284	897	714	840	787	703	1511	1605	1944	1924	2024
44	858	1383	894	953	830	1089	133	148	332	238	256	100	171	—	129	1300	1742	1681	1104	1646	854	590	840	701	825	1533	1815	1824	1787	1913
45	907	1145	1023	1073	931	1198	9	147	352	301	227	32	133	129	—	1179	1645	1476	993	1336	572	506	714	835	835	1645	2011	1958	1818	1844
46	8103	2121	2149	2113	2053	2074	1172	1289	1301	1283	1																			

QUEENSLAND WINS R.D.

Yes, VK4, with VK9's help, has won the R.D. Contest for 1971 by a substantial margin in a very friendly contest. Congratulations to the winners and thanks to all who participated. I hope everyone enjoyed themselves.

With few exceptions, all the high scoring logs were credits to the compilers. My real admiration and thanks for jobs well done. (Who had the typist on R.D. logs?) I would like you to see how well some of these logs were set out. There were duplications, but invariably there were a few points counted low to make up.

To ensure that VK4 does not capture the trophy during 1972, and for other reasons, I would appreciate you analysing the results and considering them carefully.

Tight contests make my task much more difficult, but I don't mind as long as we go ahead. Let your Federal Councillor have your ideas on a better contest—he is interested.

I have some thoughts on contest closing dates and may apply them next year.

A few contestants should look closely at contest rule 6 and P.M.G. regulations (82).

Congratulations to the listeners who submitted some fine logs.

Thanks to those ops. who put in a little note telling how they enjoyed the contest and offering suggestions of improvement.

I noted a full c.w. listeners' log from Eric Trebilcock. Trevor VK2NS put in

DETAILS OF DIVISIONAL SCORES

Division	Logs	Licencees	% Participation	Average Top Six Logs	State Points	State Score
VK2+1+9	141	2,162	6.5	884	31,185	3,014
VK3	76	1,971	9.8	817	21,689	1,642
VK4+9	124	800	14.9	1,150	30,944	5,886
VK5+9	88	802	10.7	1,245	28,950	4,341
VK6+9	60	612	11.5	1,288	16,876	3,268
VK7+0	61	243	35	730	10,603	3,389

You will note that compared to last year, ref. "A.R." Nov. 1970, we are not holding our own. This is not good because the Institute is moving forward quite steadily and successfully. Why have we not advanced with the R.D. Contest? Looking further, note the high participation level of VK7 + VK9. Even by adding a high average top six logs VK7 + VK9 would not have won this year. They needed more State points.

VK5 + VK8 and VK6 + VK9 would doubtless be around the top with a higher participation level as their average points per log is above VK4.

VK2 put up a good show, but together with VK3, seems to have the problem of participation. Why can't these States have a higher level?

There are some interesting solutions to your problem.

Most States seem to have their own form of log which goes out with their bulletin. This helps, but, as VK4 has found, is not sufficient. There must be a drive to get operators in the contest. VK4's success of the last two years has been assisted by the activities of Northern W.I.A. members.

I hope that after considering these results, you do something about making your State a winner next year.

NEW SOUTH WALES

Phone			Points	Points	Points
VK3BEC	908	VK3NPF	148	VK3SW	63
300	963	2AGZ	186	82ZX	63
2RNS	941	2BAZ	170	2SG	57
2DM	888	2ATF	188	280	57
2XT	881	2BZ	180	2ADD	54
2AJY	777	1APP	150	2YS	54
2BOP	577	2ABC	156	2ADD	45
2VG	563	2DQ	151	2AKI	45
2ATT	571	RPN	150	2JF	45
2BNS	566	2BDS	149	2AAN	45
2NP	566	2ALJ	146	2CJ	45
2BWS	491	2AFA	141	2CW	40
2RK	483	2RU	133	2ACZ	40
2AVJ	480	2AKR	132	2AAW	38
2AAC	480	2AFL	119	2EP	38
2CR	458	2BKG	117	2AEC	37
2BMM	457	2YN	112	2TK	36
647		2LT	113	2AQ	35
2AWN	436	2ASJ	111	2ZF	31
2AIM	386	2AOX	103	2AVT	27
2BDN	371	2BMD	103	2ANX	27
2OH	370	2CK	101	2AWX/P	21
2ENK	336	2AHH	87		
2AUS	332	2BRT	87	2ZWG	32
2AIA	318	2AKY	90	2LA	17
2QC	300	2BMX	90	2BTO/P	16
2AIA	278	2AMA	88	280	16
2AGV	218	2XD	63	2FJ	13
2AKQ	211	2BJT	78	2HX	5
2PF	205	2BKM	78	2ZTM	7
2AHP	204	2CT	63	2KJ	7
2APQ	203	2ON	63	2ZUT	6
2UJ	194			2ZWC	6

Open			Points	Points	Points
VK3BO	1130	VK3AJ	258	VK3RJ	67
2DO	361	2AV	140	2AU	62
2BLK	361	2AHH	82	2PP	18
2PU	286	2HZ	74		

C.W.			Points	Points	Points
VK3NS	364	VK3YB	83	VK3AKX	56
2CR	461	2ZO	83	2BTO	43
2BF	317	2AMB	60	2XQ	43
2VN	349	2ZG	77	2IV	40
2OT	184	2BKK	74	2KJ	37
2QL	181	2JY	63	2AW/P	11
2HW	143	2PQ	58		

Receiving			Points	Points	Points
M. J. Rodden			636	636	
J. H. Hillard, L2374			636	636	
G. Roessam			636	636	
P. J. Vernon, L2358			636	636	
Baltimore Youth Radio Club			636	636	
C. Ferguson, L2046			636	636	
D. W. Shephard			636	636	
W. Newport			636	636	

VICTORIA

Phone			Points	Points	Points
VK3VJ	1032	VK3VJ	419	VK3FR	180
3DF	972	2AUN	414	2AAM	131
3SM	698	2ABE	392	2AIB	106
2AXV	690	2BEE	334	2ACW	90
2WV	690	2EJ	354	2ED	82
2ADW	679	2BFB	354	2ACA	69
2AMQ	664	2BFA	354	2AIP	67
2APB	580	2AJX	253	2BFB	68
2CIF	583	2AJK	248	2DT	61
2JF	577	2AJM	247	2BFI	51
2AYL	570	2ZT	237	2AGH	35
2AFA	541	2CDX	212	2WV	29
2AKR	518	2BKN	180	2BCC	33
2EP	514	2LV	204	2BCH	29
2KI	511	2BAM	198	2KS	18
2AMT	500	2EZ	174	2ARA	17
2OJ	480	2KRP	168	2KRP	11
2BVB	484	2AXQ	160	2EPN	11
2AHH	434			2AAM	8

AUSTRALIAN CAPITAL TERRITORY

Phone			Points	Points	Points
VK3BEC	978	VK3IFT	373	VK3ICG	136
1JL	976	1MP	164	1LP	72
1ZT	594	1AN	160	1LN	18

Open			Points	Points	Points
VK3AOP	787	VK3IDA	517	VK3YH	68
1VK	704	1EP	287		

C.W.			Points	Points	Points
VK3BEC	978	VK3YB	83	VK3AKX	56
3QV	490	2ZG	77	2XQ	43
3DDE	437	2PQ	58		

Receiving			Points	Points	Points
VK3BEC	978	VK3YB	83	VK3AKX	56
3QV	490	2ZG	77	2XQ	43
3DDE	437	2PQ	58		

Receiving		
St. John's College	1336	Points
G. Leitch, L3400	795	"
F. Treblelock, L3042	248	"
R. Ward, L3458	165	"
D. M. Harrison, L3WL13448	37	"

Receiving		
C. H. Hannaford, L2506	1253	Points
B. C. Chapman, SWL3118	281	"
I. R. Kirk, L5145	609	"
J. M. Vale, L5132	678	"
J. Elliot, L5132	625	"
R. G. Edmondson, SWL5123	519	"
L. M. East, SWL5113	349	"
	148	"

Receiving		
R. Mutton	1089	Points
M. J. Fox	1077	"
R. J. Everett, L7043	768	"
R. Livingston, L7048	585	"
I. Ellings, L7038	389	"

QUEENSLAND

Phone		
Points	Points	Points
VK4XY 1189	VK4NB 216	VK4GT 43
4QZ 1188	4VX 115	4JW 41
4QZ 1182	4EB 810	4JY 41
4PX 960	4EJ 371	4QNS 36
4QY 778	4EJ 187	4QZ 36
4LT 885	4KV 156	4QX 36
6NP 804	4MJ 157	4XZ 35
4DO 822	4CZ 125	4ZM 35
4E 788	4OP 134	4AO 35
4DJ 879	4RJ 230	4LO 31
4FP 889	4RF 148	4P/P 30
4KH 849	4S 143	4P/P 30
4TN 880	4BC 139	4CW 28
4QA 596	4ZP 127	4GS 23
4IE 582	4G1 122	4HC 22
4DZ 518	4NS 115	4NV 20
4QW 490	4FE 114	4BF 11
4EZ 484	4LP 112	4ZBH 10
4VL 481	4OT 108	4EY 10
4PS 487	4VS 108	4NZ 18
4FO 398	4FN 98	4BQ 13
4NQ 385	4QJ/M 94	4KS 12
4IO 322	4PT 89	4NG 11
4JM 355	4OR 80	4ZDG 11
4CP 350	4OV 73	4EA 11
4EB 349	4RO 72	4ZRG 11
4FP 344	4TK 70	4ZTL 11
4QZ 338	4ZF 70	4ZTL 8
4PY 332	4EJ 67	4ZTK 8
4YM 298	4EA 59	4KB 8
4EJ 291	4EE 58	4ZAM 8
4QZ/T 279	4EO 57	4ZTA 8
4CI 270	4EM 54	4ZRL 8
4HJ 231	4OC 52	6ZHS 8

Open

Points	Points	Points
VK4U 940	VK4WR 553	VK4P 188
4FK 538	4XA 280	4GH 34
	4XC 184	

C.W.

Points	Points	Points
VK4X 301	VK4VR 80	VK4KK 37
4XW 237	4RH 86	4DT 34
4KI 158	9CA 34	4ON 7

Receiving

G. Lee-Manwar	1043	Points
K. Cunningham, L4104	788	"
P. Whiteaway	101	"

SOUTH AUSTRALIA

Phone		
Points	Points	Points
VK5QG 1286	VK5JR 482	VK5LC 82
5NB 1286	5VT 408	5WR 79
5PT 1261	5VB 345	5LQ 78
6Z2 1032	5AB 293	5RI 78
5NB 978	5CY 280	5DL 75
5NM 940	5EU 236	5FO 67
5JR 894	5PR 231	5ZS 69
5UP 883	5WN 217	5OZ 49
6LJ 817	5EK 217	5OT 44
6EP 801	5PD 211	5LH 40
5GM 798	5MC 211	5ZKK 39
5DK 798	5CL 208	5EQ 34
5YN 794	5CA 188	5DZ 31
5TC 752	5DV 184	5SS 23
5UT 713	5MA 188	5ZPJ 20
5WY 697	5GF 127	5ZL 18
5XN 660	5RJ 111	5ZKX 17
5AX 688	5GV 108	5ZWW 17
5QV 470	5UF 101	5ZDX 12
5ZB 451	5TV 88	5CJ 6
	5TU 83	

Open

Points	Points	Points
VK5RO 1215	VK5EJ 796	VK5FI 123
5RI 1015	5FM 415	5WI 80
5UF 978	5HM 186	5TL 80

C.W.

Points	Points	Points
VK5MY 308	VK5ZK 183	VK5KU 53
5LD 182	5MZ 103	5RK 30
5ON 146	5NS 201	5HO 8
	5AU 63	

WESTERN AUSTRALIA

Phone		
Points	Points	Points
VK6CT 1578	VK6KI 161	VK6DE 31
6ZK 1426	6LC 155	6IT 23
6LK 1408	6GB 138	6DC/HU 20
6KW 857	6WL 86	6BO 18
6DA 807	6WY 81	6XW 16
6AO 767	6AWI 50	6ZFF 16
6AY 517	6LO 71	6OR 11
6TX 484	6DC 87	6P 10
6JK 484	6SH/P 85	6AT 8
6PJ 398	6NA 31	6GQ 6
6PT 378	6BY 59	6ZDK 6
6DD 277	6TU/P 47	6ZAQ 5
6CW 226	6WD 49	6ZBT 5
6LM 208	6ZA 41	6ZER 5
	6WB 39	

Open

Points	Points	Points
VK6RU 1265	VK6R 1265	VK6R 1265
6MA 1265	6WA 1265	6ELC 1265
6AI 963	6EZ 32	

C.W.

Points	Points	Points
VK6WT 238	VK6EY 141	VK6DW 38
6BQ 234	6PY 101	

Receiving

Bradshaw, L6110	728	Points
M. Beema, L6112	843	"
A. Wallace, L6087	488	"

TASMANIA

Phone		
Points	Points	Points
VK1JV 1015	VK1TPS 128	VK1MK 32
7FM 348	7AB 85	7AX 21
7RH 281	7IL 84	7WZ 20
7AK/P 487	7VK 80	7ZK 18
7LC 397	7BJ 72	7ZJ 18
7MS 344	7PF 72	7MR 16
7UX/P 266	7BZ 72	7ZL 13
7LS 263	7GW 87	7ZS 10
7BM 219	7MT 87	7ZAS 10
7MK 201	7ZB 85	7ZCP 7
7KM 186	7RM 85	7ZNR 7
7TB 139	7ZLP 29	7ZPW 7
7BJ 123	7CP 24	7ZWX 7
	7ZWK 24	

Open

Points	Points	Points
VK1JA 117	VK1AL 259	VK3SL/7 84
TKD 447	7TB 216	TKS 12
7Z2 177	7OK 182	
	7MZ 129	

C.W.

Points	Points	Points
VK7CS 228	VK7RY 103	VK7B 18
TLJ 228	7OM 73	7YL 8
	7GB 48	

NORTHERN TERRITORY

Phone		
Points	Points	Points
VK8DI 76	804 Pta.	NH
8ZQ 76		
8AJ 63		C.W.
8JS 28		VK8HA 145 Pta.

TERRITORIES—VK9

To VK4—		
Phone		
Points	Points	Points
VK9WD 1344	Pta.	NH
9BK 1039		
9KA 577		C.W.
9GA 289		NH
9BY 164		
9BS 41		

To VK6—		
Phone		
Points	Points	Points
VK6DR 888	Pta.	VK6XI 338 Pta.
9XK 280		C.W.
9XK 114		NH

ANTARCTICA

Phone		
Points	Points	Points
VK0MX 248	Pta.	VK0CC 372 Pta.
6TK 208		C.W.
6IN 158		NH

LATE LOGS

Vks 5BE, 5RD, 5SR, 6VE, 6XY, 6ZCD, 6DM;	
S.w.I. L. Berlioth	

CHECK LOGS

Vks 3ET, 3AB, 4RC, 4TC.	
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NEW ZEALAND

Phone		
Points	Points	Points
ZL1AK 731	Pta.	ZL1B 750 Pta.
728		10B 81
1ACL 531		3ABC 427 "
1ARO 284		6CA 475 "
1AGO 280		
2AB 281		C.W.
2ACP 482		NH
2OJ 438		
2PM 597		Receiving
		ZL18 525 Pta.

Check Logs: ZL1CK, ZL1AWH, and ZL1KB.

Some Kiwi comments "Look forward to next year's contest." "Got a big kick out of it, as did all the ZLs I spoke to, and will be in boats and all next year." "... in the future we will see more ZLs taking part." "A good contest ... Very friendly atmosphere throughout the test—a change from the rat-race."

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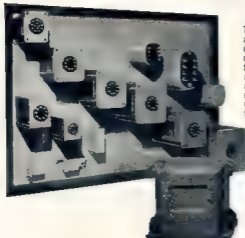
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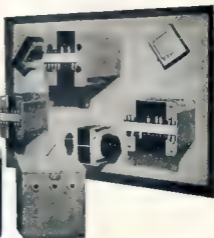
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LM 51



The Wireless Institute of Australia is pleased to invite Australian Amateurs to become members of the Key Section. The aims of the Key Section and qualifications for membership are as follows:

1. The Key Section of the W.I.A. is an association of Australian Amateurs interested in the use of Morse for communication.
2. Membership is open to any Amateur who holds a VK call sign, other interested persons may be admitted as associates.
3. Amateurs may become members by applying to the Key Section, applicants may be asked to provide proof that they satisfy the conditions for membership.
4. For the purpose of assessing membership of the Key Section, the following conditions define a contact with another Amateur station:
 - (1) The communication must be by A1 or A2 mode by both stations
 - (2) The contact must last at least 15 min.

- (3) The speed of sending is not a condition of these rules.
- (4) Contacts made during contests are not admissible.
- (5) Contacts made before 11st January, 1971, are not admissible.
- (6) Any one call sign may be used only once in assessing scores.

5. Membership is open to Amateurs who communicate at least 50 points by the rules of paragraph 4, at least 25 of which must arise from contacts with other VK stations.

6. Points are obtained as follows:

- (1) A contact as defined in paragraph 4 counts one point.
- (2) If one station in the contact is operating 52 MHz. or above, the contact counts two points, if both stations are operating 52 MHz. or above the contact counts four points.

7. All applications for membership of the Key Section should be sent to Federal Manager, Key Section, W.I.A., P.O. Box 67, East Melbourne, Vic., 3002. The consideration of applications for membership will be undertaken by Divisional Co-ordinators, who are appointed by Divisional Councils, or their nominated deputies. In the event of dispute, the ruling of the Federal Manager will be final.

8. A certificate of membership will be issued.

New members of the Key Section will be listed from time to time in "A.R." It is planned to offer associate membership to overseas Amateurs, and perhaps also to S.W.s. These schemes, and others, will be made known when our numbers have grown. I look forward to hearing from you! 73, Deane VK3TX.

STOLEN

From the house garage of VK3BDD D Vlasopoulos, 2 Sandgate Ave., Glen Waverley, Vic., 3150 (phone 232-8489) about July were the following:

Iruce IC720T Tx, IC700R Rx, IC700P p.s.u., home-brew linear lkw. in., digital freq. meter, home-brew multi-compete, Lafayette v.a.m. and tv rejuvenator, Philips r.f. fm. generator, home-brew audio generator.

The matter is under police investigation. If anybody is offered any item from the above list or has any useful knowledge concerning them please contact the police or the operator concerned.



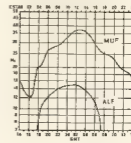
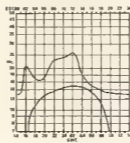
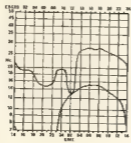
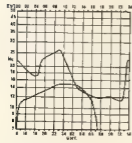
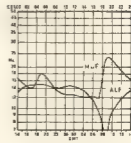
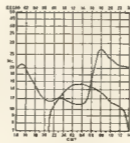
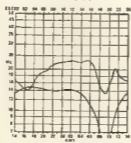
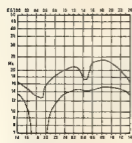
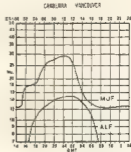
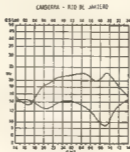
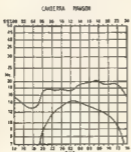
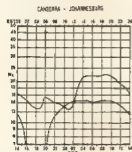
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Further information from the Australian agents, R. H. Cunningham Pty. Ltd., 608 Collins St., Melbourne, Vic., 3006.

PREDICTION CHARTS FOR NOVEMBER 1971

(Prediction Charts by courtesy of Ionospheric Prediction Service)



Amateur Radio, November, 1971

By H. F. EVERTICK
C/o P.O. Box 36 East Melbourne, Vic. 3002
(Times are in GMT.)

News seems scarce this month. That is to say, news which is not out of date by the time you read this. Being winter in the Northern Hemisphere, the DX band is not as busy as certainly nobody would have a shot at, say, Korkali, at this season. But where are the Southern Hemisphere DX-opportunities?

Perhaps there will be good time to look ahead. We have become so accustomed to thinking about the bands from 1.8 to 28 MHz as DX bands (possibly adding 33 MHz now and again) that they are known simply as the DX bands. No need for any explanations. Everyone knows what you mean.

In a few years we may have to change our ideas. Satellites are bound to come along before this decade is finished which will cause us to scrap the term "DX bands" and replace it with "satellite bands". The development of repeaters in the U.S.A. and here elsewhere has already extended to satellite. However, the use of repeaters in geophysical orbits carrying repeaters on VHF.

Will this mean the scrapping of DX certificates as we know them? Will it become easier and more reliable to work into Kansas or Kidderminster on a v.h.f. pipe-line rather than through the atmosphere, terrestrial paths? Will we use now?—when we can get through? I suppose, though, the amount of QRM is bound to limit the usefulness of any system unless there are hundreds of channels available or something else is done.

It is always disconcerting when you talk with a friend on the street on a dead DX band and suddenly become aware of a breaker 2,000 miles away. If you were more disconcerting could be. How much more disconcerting could be? If you were using a telephone-type contact on metres from your car on the way home from work and became aware of a breaker motoring off to his self-made in London. Similar thoughts have been aired in the past but today the reality seems closer. What triggered my thoughts were the reports of VK3JAF and the article in the Victorian VHFer by VK3JAF.

If all that does come to pass, the days of prediction charts might become numbered. Looking through the pages of this column, one other day was an interesting exercise in speculating how they will work out in practice.

For the short path to London, the peak from Perth extends almost to 30 MHz as against 27 MHz from Melbourne and 28 MHz from Canberra. However, the Canberra peak is some half an hour later than the other two. The MUF dips down into the ALF for all three, but only down to 12 MHz for Perth as opposed to 11 for Melbourne and 10 for Canberra. Once again, all are at about the same time. However, for Perth the ALF is a much broader based curve than the other two. The MUF openings extend from 1430 to 2200z, for Melbourne from 1330 to 2100z, and for Canberra from 1330 to 2020z. The ALF peaks rise to more than 15 MHz for Perth, 14 for Melbourne, but for Perth the peaks rise later than the other two.

Looking in the other direction, it would pay to live on the East coast to work into San Francisco. In Canberra the MUF peaks to 30 MHz, and Melbourne 27 MHz, both at 0100z, but from Perth it reaches just over 25 MHz at 0900z. The ALF curves are more interesting though. From Canberra the ALF never drops below 15 MHz, whereas for Melbourne it is a dense rising to 15 MHz, at 2400z with a base extending from 1530 to 1800z, and for Perth it comes also rises to 15 MHz, but at 0300z with a base extending from 1945 to 0100z. In different terms, the 14 MHz band would be open from 1330 to 2100z from 0600-0900z and 1500-2100z, and from Canberra 0900-0900z and 1500-2100z, and from Melbourne 1200-1300z and 1500-2100z. Although comparable tables were not available going northwards of course gives greater perspective for example the MUF path from Perth to Hawaii peaks to nearly 30 MHz at 0200z, whereas for Adelaide it reaches only 28 MHz at 0100z.

The long path to London is a complex interweaving of MUF and ALF curves for all three places. However, it would seem impossible to work into London on 30 MHz from Perth whereas from Melbourne it would be theoretically possible from 0800-0915z and from

Canberra half an hour earlier. For closer N.S. paths, the possibilities of 28 MHz DX are better from Perth, particularly on 1F modes as opposed to 3P, but these are more obvious comments.

It was always very interesting to see the prediction charts used in the VK3 Bulletin, as organised by Frank Hine, and by extension to see if there could be any way to distribute the information. For example, the path to Nairobi for November could be shown thus (local times):

21 MHz.—
From Perth —5 1600 + 4
Melbourne —4 1700 + 4
Canberra —4 1700 + 4

14 MHz.—
From Perth —5 0000 + 4, —2 0800 + 3
Melbourne —3 0000 + 3, —2 0830 + 3
Canberra —4 0030 + 3, —3 0800 + 3

7 MHz.—
From Perth —4 0300 + 4
Melbourne —3 0400 + 3
Canberra —3 0400 + 3
—3 0400 + 2

Because the ALF curves often run more or less vertical below 7 MHz, there is a significant little difference between the 7 and 3.5 MHz bands—possibly half an hour each side of the centre time for 3.5 as against 7 MHz. In other words, if the central opening time is taken for 3.5 MHz, the opening would last half an hour longer each side of the central time.

Looking at the Prediction Charts in September "A.R." illustrates a number of points on which to watch for numerical notations. Take the 14 MHz band to London lens with as an example. The MUF reaches peaks about 2100z and 0600z, both possessing sharp rise times with slow numerical notation. The 14 MHz, this would be shown as 2100z plus 5 and minus 1 0600z plus 5/4. For the shorter path the notation would read minus 4/4 0600z plus 5/4.

However, looking at the same two charts for 7 MHz, openings we get minus 5/4 0700z plus 5/4 and minus 3/4 0800z plus 5/4 respectively. The shorter time from 'centre' indicates a more vertical ALF curve and hence less predictable.

It is an unfortunate fact of life today that prediction charts in their present form are becoming more and more costly to reproduce. The writer holds the view that prediction charts of this kind are easier and quicker to comprehend than those in any other form so far produced in other magazines. However, these charts are being used as a magnifying glass to know if the curves hold good for most of the month or only a part, leaving aside, of course, the other rather obvious shortcomings. A sharply rising or falling curve on the chart and a cross-crossing of the MUF-ALF curves would appear to indicate the use of sensitive times. It is hard to change in the same way that peaks and troughs ordinarily change shape rather more rapidly than their actual heights or depths.

If we are compelled to consider a method of numerical notation, the examples quoted might be useful for consideration by DXers.

160 Metres. VK3JAP writes with details of the 160 mhz annual Trans-Pacific Tests received from WIBB. The idea under the name of Contest Calendar which is re-introduced in this issue. In previous years there have been plenty of stations looking for contacts despite the QRM and many contacts were made even on seemingly impossible nights.

The drill is that WVE stations call CQ DX Test on the hour with VK/ZL JA looking also on the hour. The frequencies in kHz are 1800-1806 for VK, 1800-1810 for WVE, 1807-1814 for WIBB and 1814-1816 for ZL. As 1875-2000 for KJ16 the times are 1330z or earlier to 1600z and the activity dates are Nov. 6, 20, Dec. 4, 16, Jan. 1, 15; Feb. 5, 19.

DXers are looking for DX from 0700z to 1000z on the same days. Reports of QSOs are requested and should be sent direct to WIBB, 36 Pleasant St., Wintthrop, Mass. 02153, U.S.A. For inclusion in the 160 metre news bulletin. Last month this column published details of WINGT's activity periods

8 Metres. From 1st Nov to end of Jan, VK6PQ on 52.00 MHz from Casey and VK6XN on 52.05 MHz from Mawson/Wilkes will be looking respectively for DX. This is reportedly a first between 5000z and 0700z and 0800z to 1000z. Call signs will be sent in short bursts followed by listening.

Recent VK6BQZ of Wanchape in an interesting letter, received too late for October "A.R.", gives details of contacts with 81WV, the Boy Scouts' 15th World Jamboree Station at Aengeli Island in Johnston Atoll. The station was worked by the station and his son, Seno, happened to be there at the time. A good article appeared in the Hanga Shire Gazette in January. The station is reportedly a first. I wonder how the Scout Jamboree on the Atoll will go this year—here again details arrived too late for inclusion in last month's "A.R."

Reported VK6XN as usual came with much interesting material for this column. The station was on 1410 kHz c.w. early in September. This station operated from Zugar is, part of the Farson Group, and was recognised by A.R.R.L. from 1st Aug. 1971 as New DXCC country listing under the names Abu Ali and Jabel Al Tair Islands (QST Aug. '71).

Those who are in the same group as July "A.R." quoted the QSO Murray Add as 11LJ, but Murray quotes 11LJ from another source. Perhaps somebody knows the answers to these queries. Murray also reports a 2406 Dharan on s.b. This is a "club" station with a number of American oilfield and other operators. Murray also reports many peaks. Murray's lists also include many smaller and 17LMLK (c.w. 7 MHz), F3A7AE (s.b. 14), 17LMLK (s.b. 14), G3FCF/MAX (c.w. 14), presumably mobile, G3FCF/MAX (c.w. 14 and 08AVE (c.w. 7; Lima, Peru).

Murray joins everyone else in complaining about the dearth of poor old 10 metres and listed 40 and 20 as "improving". He also mentions the QRM from non-Amateur stations, particularly on 7 MHz, but from another source. However, he is not in the habit of using and reporting. This is splendid work requiring many operators, much time and great patience. These days, however, it is not unusual for lame chatter and puerile remarks could find a most useful panacea for boredom by listing interesting DX stations. Lima, are extremely active on 40 and 80 metres.

Darlene (ex 2BDK) may operate from Tazee European DX-spots in Nov. such as 3A.

73 Magalona. DX notes mention a possible activity from VZ1P, 73 Magalona, and that BV2A is the only present activity in Taiwan (xlt controlled 1400z around 1800z).

RTTY. Radio 25 of July mentions several European CB stations for active on 30 MHz. ZS8A OW, CZ, SZ, GS, GE and DD.

Contest Results. Am glad to correct any erroneous impressions. AX3APK listed in Sept. 1971. The contest was held on 14 MHz. This is an all time record. In the "CQ" W.W. DX Contest "CQ" Club, the VK3DYF is listed as the all bands single operator. Phone work record holder (1971), VK3KO on 1.8, VK3NO on 7, VK3APJ on 14 and VK3UG on 28 MHz, all single op, single band, c.w. would record holders with AX3BKM multi-op, single transmitter, multi-bands, record holder.

On 15 Sept. 1971 N.F.D. VK3H P. found 2nd position in overseas check logs s.v.s. G stations 344 points (1 "R.C." Sept.

Again from "CQ" of Oct., it is observed that VK3DYF has been in the 300z advancement in the "CQ" DX Award (c.w. Cert. 37) and joins the CW WEXF Honour Roll with 809 prefixes. VK3DYF joined the 300z prefix S.D.M. and VK3KAM and VK3KAM Cert. 381 in WAZ 83B (CQ July).

Contest Calendar:
Nov. 6/7—RSGB 7 MHz. Phone DX
Nov. 13-14—RSGB 2nd 18 MHz DX

Nov. 27/28—CQ W.W. DX C-w.
Dec. 11/12—Spanish c.w.
Dec. 11-23—Ross Hull Memorial V.h.f.
Feb. 12/13—John Moyle N.F.D.

Late News.—From Charles VK3UAF via Paddy 457BP on SEA net 14320 at 1200z daily came news of a probable KUJAA call by the Univ. of Hawaii. Charles is waiting for John VETIR/XU, operations, believed approved by A.R.R.L. for DXCC. Also that the ZD5 boys were on 1410 kHz c.w. from 500z to 1000z formerly ZD5XJ. Charles other data is in the QSL column but he also mentions 4W1AF on 1410 kHz c.w. from 500z to 1000z of the Sunday DX group net by Nick YV4UD, from first Sunday in Nov on 1410 from 1330z. There is also the possibility of a new prefix for

Don Grantley will be writing the DX notes in future and please forward any copy to him at P.O. Box 222, Penrith, N.S.W. 2756.

Amateur Radio, November, 1971

CORRESPONDENCE:

NOVICE LICENSING

Editor "A.R." Dear Sir,

I feel that the "pearls of wisdom" of VK3RN "A.R." July '71) and the comments of his supporter, VK4HD "I.A.R." Sept. '71) concerning Novice licences should not go unchallenged.

It would almost appear from the remarks of these two Amateurs that they want the hobby of Amateur Radio to be the exclusive old gentlemen's club. It is very fortunate for them that they are already members of this exclusive association but it is not so fortunate for the use of its brilliant matriculation physics students (excepted) that the doors are kept a little tighter closed than some would like.

What about the ordinary, keen, prospective Radio Amateur, Mr Morgan? Why not let him in, via a lower grade licence which he could hold for a limited time? And, if it would seem to you to be such an irreverent process to have a Novice licence, why not agree to have such a measure put into operation on a trial basis as has been suggested by VK3RW and VK4GS? This would test the prove whether the Novice licence had merit or not.

Some considerable comment has been made about the 100 metre band as a possible training ground for Novices. As any Amateur in N.S.W. must agree, the portion above 1830 kilohertz is useless for long distance work because of the severe interference from the Loran station in the Philippines. And in the daytime, when perhaps Novices could try cross-country work, some bands would be ideal with interference to other stations as remote as interstate 2 metre contacts.

The radio clubs in this state are always busy preparing prospective Radio Amateurs for the A.O.C.P. Many of the students find great difficulty in passing the examination at the first attempt. Many of them try again and again to gain the qualification which would get them on the air. Some become disillusioned by the complexity of the questions and the very difficult pass mark of 70 per cent. Some of these candidates are over 40. Few of them are student students. But all of them have one aim in common. They would like to gain their Amateur licence and take part in a rewarding and absorbing hobby.

Only those who conduct classes in the many radio clubs can fully realise the frustrations of those who just can't make it. In 1950, was the technical standard of the licence examination of the same level as it is in 1971? Perhaps when you went for your licence Mr Morgan, things were a bit easier. Perhaps those days they had a syllabus in Leaving certificate physics which encompassed the whole of the course for the A.O.C.P. Perhaps they did then Mr Morgan, but they don't do so now. Even teacher members of this club have had to study additional material to gain their A.O.C.P. so how your Matriculation students could accomplish this feat without any preparation whatsoever is a mystery to many of our members.

Surveys conducted by this club indicate that the great majority of members, including those who are already Radio Amateurs, support the report on Novice licensing as put forward at the Easter Convention. Our membership is quite large by local standards at over 180, but as I pointed out before, many of us are still on the outside. We would benefit by the introduction of a Novice licence and so would the Amateur Service in Australia. The Amateur population would be increased, despite what Mr Higginbotham suggests, and, by including a Morse telegraphy requirement, as has been suggested, we would hope that the increase would be one of quality also.

I trust that the thinking Radio Amateurs will read the report on Novice licensing prepared under the chairmanship of Mr Rex Black. I hope that Amateurs will make constructive suggestions as to how the recommendations in the report may be amended, and I certainly hope that the Institute will be able to give the Amateur Radio just as much as all your other correspondents, even Mr Higginbotham and Mr Morgan.

—E. C. Brockbank Secretary,
Weekdays Radio Club

Editor "A.R." Dear Sir,

I read with interest a letter written by Mr. Ivor Morgan concerning Novice licences in the Sept. issue. I am a sixth form student at Beaugate High School and I am studying sciences at the First level. Without any preparation whatsoever Mr Morgan? You must be joking!
R. A. Day, VK2BRI.

Editor "A.R." Dear Sir,

I have read with interest Mr Morgan's letter as published in the Sept. issue of "A.R." I consider his statement that a boy doing physics at Matriculation level could pass the A.O.C.P. without any preparation whatsoever to be rather irresponsible.

Speaking as a high school teacher of science, I am quite convinced that your correspondent has been misled. The electronics content in the high school physics course constitutes a minute fraction of the mass of knowledge needed to pass the A.O.C.P.

The fact that some high school boys can pass the Amateur examination in radio theory is most likely due to considerable effort on the part of the candidate outside the classroom.

—F. R. Overvield, VK2ZFO,
Science Dept., Broadmeadow H.S.

Editor "A.R." Dear Sir,

Having read the latest correspondence on the important matter of Novice licensing, I should like to offer a few comments from the point of view of an A.O.C.P. correspondence student, associate member No. 9633 of the W.I.A. and a would-be Amateur.

Your first correspondent, Mr Morgan, denies the suggestion of a lower level Amateur licence and quotes the cases of boys who have passed the P.M.G. Amateur examination on the basis of school physics alone "without any preparation whatsoever". This statement, of course, is designed to stress the opinion which he presumably holds, that the A.O.C.P. is within the capacities of anyone with two arms and two legs. I do not know what occupation Mr Morgan follows and I regard with respect his 40 years of Amateur experience, but I emphatically

deny that any school physics course covers the theory section of the prescribed A.O.C.P. syllabus. Such exaggerated statements do nothing to bolster the strength of the anti-Novice cause, which this correspondent is apparently trying to do.

I can assure you and him and anyone else that I should welcome a Novice licence if it could offer me a quicker means of getting on the air to improve my operating skills and give me experience which the present system denies me. In my present location I am remote from other licensed Amateurs and radio clubs, and I should have to rely on advice from well disposed Amateur friends and from reference books on the subject. I can see a lot of merit in the position whereby I should be permitted to start in a small way with a 10-watt transmitter, simple antenna system, and crystal control as set down in the Novice proposals. The Morse code requirement is one which I am quite happy to observe, as I regard this as a traditional and valuable means of communication. I would not be at all affronted at the idea of being an Associate member of the Institute rather than a Full member, and could well accept the fact that the older and more experienced members would tend to regard me—and the other Novices—as "apprentice Amateurs", as indicated in the Novice Committee's report. On the other hand, I should be intrigued and pleased if Mr Morgan and other well disposed Amateurs would accept Novices as Full members because of sharing transmitting privileges. Also, I should be grateful to receive the benefit of their suggestions as to how I could improve my operating methods and my technical knowledge.

I do not work in a job associated with electronics, so I find the A.O.C.P. course quite difficult. The small amount of electricity which I studied in my school science course does not take me very far along the involved study papers which the correspondence course provides. I have considered the system of examining the last few A.O.C.P. question papers seeing which topics occur repeatedly and preparing "standard fashion" a limited number of topics, trusting to luck that seven of them

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would appear in the A.O.C.P. paper which I attempted. I realise that this method would offer a very limited radio knowledge even if I did not have to cover any of the 70 per cent marks barrier. But, if a Novice licence period of operating could be provided, I am certain that the practical work involved in building my own gear and operating it would give me a far more useful background than a crash course on a limited number of topics. I therefore would be a "better" Amateur operator when I finally passed the A.O.C.P.

Mr. Morgan has stated that "the regulations can be learned in one evening prior to the examination". Having perused the specified handbook, I am quite sure that such a cursory consideration of the regulations of Amateur operating is most undesirable and I am surprised to think that such an experienced Amateur has such an attitude. One who thinks that his approach would be towards a long and well-learned preparation on this vital section of Radio Amateur lore. No, Mr. Morgan, when I get on the air it will be with a sound knowledge of regulations—not merely a hasty scanning to pass a fairly simple test.

I must state that the most assailable contribution to this issue has appeared in letters from Mr. Shawsmith, VK4SS, and Mr. Ouburill, VK3WV, both of whom suggest a trial period of perhaps six years. The R.M.C. representatives would consider the success or failure of the experiment and act accordingly. This is a very fair approach to—

—Mick Redden.

Editor "A.R." Dear Sir,

During this week I received from the Federal Manager a photostatic copy of a letter addressed to you and relating to the subject of Novice licensing. This letter was written by Mr. Gordon (VK3DH) and follows my personal letter to him to clarify and discuss various items relating to this allegedly contentious topic. While his letter to him was reasonable and friendly in tone and certainly did not warrant the objectionable tenor of his communication. In the event of his letter, after this letter, I feel that you might consider printing mine to him in order that readers may assess the nature and content of his statements.

—R. C. Black, VK3YA.

Editor "A.R." Dear Sir,

Count me in on this entrance exam controversy. I belong to the minority group of genuine Amateurs and Experimenters.

I have had more experience than most with this same exam, having failed it five or six times in a row about six years ago. I could quite easily fail it again a couple of times now. It is loaded in favour of the high school type of student, while the less educated, slow writer, aged, or purely physical workers, are all practically debared.

Down grading is a step in the right direction provided that it is counter balanced by upgrading at the other end.

If we had up-graded both our entrance exam, and our experimental projects in line with the advances in science, we would now have been providing both technicians and scientists with the computer and laser industries. Instead of this, we have turned our organisation into a network devoted entirely to entertainment (particularly in recent years since commerce has invaded our ranks).

Let us consider this question on a "who gains, who loses" basis.

The "trade" occupies the box seat. In fact for them it will be a real bonanza. The present members will not lose any prestige. That was lost years ago. The experimenters will be pushed any further off the popular bands. They have already been pushed off.

Let us now consider the standard entrants who are to be entitled into our organisation with suitable pleasure hunting bait. The result will be (1) a big increase in the number of pleasure hunters, (2) a proportional increase in the influence of the "trade" in our affairs; (3) the public abandonment of any claim to be interested in the scientific section of our organisation through lack of proportionate numbers.

A glance at our award system accurately illustrates Amateur Radio as it is in 1971. The highest Amateur awards go to those willing to spend the most money to get it.

If the present proposal is adopted the position will be much worse. No brains will be required to enter our ranks. If the entrant has 500 dollars and some nimble fingers he need no brains after he has entered either. The highest awards in our Amateur ranks are within his grasp.

This position should be commemorated in pictorial form, either in a badge or a plaque, it could depict nimble fingers twisting a dial

on a background of a 500 dollar note. This could be mounted on the back of a crushed "experimenter", or hung round his neck like a mill-stone. The foreground could contain suitable "awards" artistically draped, with the surplus stacked in the corner.

The general public will soon regard us as 500 dollar scientists who are intent on a pleasure hunt that is free of entertainment tax.

We must all agree that the projected step is fundamentally sound and desirable. It is the side effects that are disastrous. To raise the level proportionately at the other end is not feasible.

I would propose that our experimental section be given more recognition. That they be banded together in a quite distinct group (for experimental purposes only). This group should abandon the commercialised lower freq. to the pleasure hunters (including themselves).

It should be agreed that the (at best) 144 MHz. band and above it be recognised as the domain of the legitimate experimenter. A gentleman's agreement on these lines would probably be sufficient to keep the 800 dollar guy crackers out.

By this method we may hold our experimenters within the W.L.A. even those (including myself) they may be experimenting in the infra red to ultra violet part of the spectrum.

The commercialising of our organisation has separated the sheep from the goats. Intellectually and financially. In a similar manner this proposed method will separate the newcomers. The "cream" of the intake will come to us on a higher level. If we are strong. If we are not there, then Amateur Radio will be inflicting an act of injustice on that group.

Until quite recently the experimental section had to submit to whatever treatment was meted out to them. This position has now changed.

The science of lasers and lasers have opened the infra red to ultra violet part of the spectrum. There is no valid reason, under existing conditions, why the average experimenter should even be on the Amateur bands. The experimenters are being pushed higher and higher. Automation in the form of microprocessors have invaded even the 144 MHz. band. If we are to hold our experimenters within our ranks, then this band should be held for them.

In the interests of Amateur Radio the removal of injustices to prospective members should not cause further injustice to be inflicted on our own members. I favour lowering

that standard. I believe that there is room for all on our bands. This will not be so if we divide ourselves into the groups "the pushers" and "the pushed".

—A. J. C. Thompson, VK4AT

Mr. J. Wright, of Clifton Hill, Vic, asks why there is so much objection to Novice licensing when for many years the Amateur bands had limited use. Despite the plea "use the bands or lose them" parts were lost. If there had been such licensing years ago, it might have kept the bands going. He then asks that if we are not to have Novice licensing, what about updating the exam, paper similar to the New Zealand system of 50 questions with alternative answers for completion in three hours.

Of the two countries having the highest ratio of Amateurs to population, U.S.A. which has Novices and New Zealand which does not, seems to indicate the type of exam. Is not reason in the latter case rather than a higher percentage of technically minded people there than in Australia. He is convinced the New Zealand exam paper system is better than ours, particularly where the candidate is unversed in the R.M.C.'s present methods of examinations. His final two paragraphs read—

"In conclusion, I would like to say that it is a pity that the people who have their licences but spend a large portion of their time listening to 73.24 MHz. can't put this time to more use in helping some of the illegal operators on this frequency do the right thing, instead of simply rejecting them.

Perhaps this wasted time could be put to better use by 'intruder' watching the bands that count."

Mr. Ian Loughnan, of Penrith, N.S.W., writes that he is a member of the Y.R.C.B. and is very interested in the possibility of a Novice licence scheme in the hopes he can enter Amateur Radio through this channel. Being aware of opposition to Novice licensing he asks why it should not become as good as in the U.S.A. He hopes to enter the radio and communications field in due course and believes that his Y.R.C.B. studies plus operating an N.I. station would be good groundwork especially as he has already found that Y.R.C.B. courses have helped him in his school subjects especially science. He believes he can keep up his school work and still have time for radio as a hobby. He, therefore, supports N.I.

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INTRUDER WATCH

By AM Chandler, VKSLC, Federal Co-ordinator

At long last tangible interest in the Intruder Watch organisation is beginning to be evident. Reports are commencing to come through, but we still need more Observers, and if you wish to free your bands of intruders it is very reasonable to request them when you hear them, and "that is all the time!"

The following extract from the U.S. is interesting: "Notwithstanding the frequency agreements, non-Amateur stations will be heard in the exclusive Amateur bands from time to time. There is unfortunately an anomaly in the regulations which allows an Administration to assign any station any frequency provided that no interference is caused by any station of another country operating in accordance with the allocations tabled in other words, if Amateurs fail to object to interference from non-Amateur stations in the Amateur bands, the Administration concerned is justified in feeling it is complying with the regulations. Enough reports often result in the removal of the intruder concerned." Thus you see how important it is for us to appoint as many Observers as possible.

Another quote from overseas may be of interest: "I happened to catch two tactical stations working some other, and arranged for someone to break into their net in order to see what would happen. This was done by carefully zero beating one of the stations and sending groups identical to theirs. The sequence of their operation leads me to the following tentative description of their communication procedure. First is the call-up procedure—WTLB de Y553 HJ—the 'HJ' could mean QSA or simply K. Second, after the stations have established contact the term 'KH' plus a number indicating the number of messages. 'TV' is frequently used in situations which could mean either QRV or QRX. Most frequently it is used when a station appears to have received a part of a message okay.

"The manner of operation is full break-in, and should a station miss a group he will send a series of rapid 'R R R' until he breaks the transmitting station. All groups consist of four letters 'NDLB NJKP PLUT' etc. When the receiving station succeeds in breaking the transmitting station he asks for file as follows: '24W'—meaning repeat group 24; the transmitting station then repeats the group and makes a short pause. Should the receiving station wish him to repeat it again, a long dash will obtain the desired result. Should persistent interference be encountered the station signals the other by a slow 'S' repeated several times. Should the interfering station

**AMATEUR FREQUENCIES:
ONLY THE STRONG GO ON—SO
SHOULD A LOT MORE AMATEURS!**

sound like one of their own, they will then send 'DD', which I interpret as a request to identify. A response using a home-made call similar to theirs was made. This was answered in one case by a request to wait—'A5J'—and when the calling was persisted in, breaking their communication, they lapsed back into the 'S' business and began taking evasive action moving up and down without an apparent co-ordination, as though such evasive action is prescribed automatically as part of their procedure. When persisted in following them they were QRX, returning in three to five minutes."

I wonder if this procedure is ethical? It is very interesting though. What say?

OBITUARY

JIM NEIDCEK, VK3AIC (ex W5WEW)

Known to many who are active on the h.f. bands, Jim has been an active member of both the W.I.A. and the Eastern and District Radio Club since arriving here in Australia to live over three years ago.

Jim was born in Pennsylvania and lived in the town of Bethlehem, Penna., where he was employed as a Chief Engineer of the Pennsylvania-Baltimore Railroad. Co. Jim took part in many early developments of the teletype system used for communication within the railroad organisation.

Later his daughter married and moved to Australia to live. Her name is Laurie VK3AGO. Jim later also moved to Australia and, together with Laurie, gave puppet shows to many thousands of children in the primary schools.

Jim is considered a great loss, not only to Amateur Radio, but also to all groups and associations to which he belonged. Jim leaves a wife, VI VK3BAK, and sister Mrs. Hanson, to whom we offer condolences.

CLIFFORD C. M. COUCHMAN, VK3KE

Cliff was born near Toowoomba, Qld., in 1907 and passed away at Dalby, the Darling Downs, on 17th Sept. 1971, after a short illness.

The holder of a Commercial ticket, he first joined the Amateur bands in 1930 and served for five years in the Royal Australian Navy during World War II.

Cliff was on the staff of National Broadcasting Station 4QB, Dalby, for 10 years, but left to devote full time to his electrical repair business and was widely known throughout the district as "Mr. Fix-it".

Although not active on the Amateur bands in recent years, he never lost interest in Amateur Radio. Cliff never married, and is survived by his sister, Miss Jean Couchman, to whom we offer our sincere sympathy.

W.I.A. NOVICE INVESTIGATION COMMITTEE

Since the original Novice Report was submitted to the Eastern Federal Convention in Brisbane the following proposals have been received from various sources and are submitted for consideration and opinion.

NOVICE LICENSING

Scheme No. 1—

That there should be a range of five grades of Amateur transmitting licences on the following basis:

(a) Preliminary Licence—No Morse code test; Regulations as for A.O.C.P. No theory examination; a practical and oral test on equipment leading to the Third Class Commercial Licence (as issued to operators of Fishing craft, pleasure craft, etc.), operation on v.h.f. only—probable areas in 144 and 430; voice operation only; equipment to be P.M.G. type-approved and commercially manufactured; limited power say 5 or 10 watts!

Note: This form of licence would suit those who are "communicators" rather than "technicians." It would approximate to a hobby class C.B. but would avoid the rivalry that exists between Amateur Radio and C.B. in U.S.A. and would add a group to the W.I.A. who would not enter the Amateur society under U.S.A. or N.Z. conditions. This type of group could be set up within the W.I.A. framework to organise the activities of this group. Perhaps a limited licence should be incorporated into the licensing conditions—perhaps not.

(b) Technician Licence—Morse code test at 5 w.p.m.; Regulations as for A.O.C.P.; Theory examination at sub-A.O.C.P. level with concentration on v.h.f. techniques. Operation on v.h.f. bands or segments to be determined; 10 watts input, C.W. and r.v.t. operation. Limited tenure period—say two years.

(c) Novice Licence—Morse code test at 5 w.p.m.; Regulations as for A.O.C.P.; Theory examination at sub-A.O.C.P. level with concentration on c.w. techniques. Operation on h.f. bands or segments to be determined; crystal control, c.w. only. No time limit on tenure.

(d) and (e) A.O.L.C.P. and A.O.C.P. as at present.

Scheme No. 2—

That there should be a range of three grades of Amateur transmitting licences on the following basis:

(a) Amateur Operator's Restricted Certificate of Proficiency—Morse code test at 5 w.p.m.; Regulations as for A.O.C.P., Theory examination at A.O.C.P. level in Part A (Telegraphy transmission) section of A.O.C.P. exam. Operation with 10 watts, crystal control, c.w. only, band segments. Two years tenure.

(b) and (c) A.O.L.C.P. and A.O.C.P. as at present.

Scheme No. 3—

That there should be a range of four grades of Amateur transmitting licences on the following basis:

(a) Amateur Operator's Certificate in Basic or Preliminary or Restricted Telegraphy—Morse code test at 5 w.p.m.; Regulations as for A.O.C.P. Theory examination based on Part A (Telegraphy transmission) section of A.O.C.P. Theory examination, marks for pass 50 to 59 per cent, operation with 10 watts input, v.w. only, segments of v.h.f. bands or bands—perhaps 80 and 49 or 90 and 15. Limited tenure for period to be determined.

(b) Amateur Operator's Certificate in Telegraphy—Morse code test at 10 w.p.m.; Regulations as for A.O.C.P.; Theory examination 70 per cent of marks (or more) in Part A of A.O.C.P. Theory examination. Operation with 100 watts, crystal, v.s.o., v.l.n. to control frequency, c.w. only, use of v.s. segments of all h.f. bands. No time limit on tenure.

(c) and (d) A.O.L.C.P. and A.O.C.P. as at present.

Note that reference is made to Part A of A.O.C.P. examination. A sample exam paper to meet this format has been made and is set for present under discussion by Eastern Zone "Victoria" Novice Investigation Committee. This will be distributed as soon as it is returned from E.Z. with commentary.

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DIVISIONAL NOTES

DIVISIONAL CALENDAR

Listed also to Divisional Broadcasts

- 5 Nov. VK3-V.H.F. meeting; Hunter Branch meeting; Gosford meeting.
 7 Nov. VK3-V.H.F. Field Day, 1160-1500 EST.
 19 Nov. VK3-Gosford meeting.
 21 Nov. VK3-Midland Zone's H.F. and V.H.F. Rally at Lake Espook.
 VK3-V.H.F. Group Picnic, Morialta.
 24 Nov. VK3-V.H.F. Fox Hunt.
 26 Nov. VK3-General meeting.
 27 Nov. VK3-Zone Banquet, Evandale Memorial Hall from 18.00 hours.
 28 Nov. VK3-V.H.F. meeting (suction night); Hunter Branch meeting; Gosford meeting.
 5 Dec. VK3-V.H.F. Field Day, 1160-1500 EST.
 VK3-V.H.F. Field Day, 630-1930 and 1230-1530 EST.
 11 Dec. VK3-V.H.F. Christmas Party; V.H.F. Fox Hunt.
 12 Dec. VK3-V.H.F. Dist. Bd. Club Xmas Outing all day, families, Yarra Glen.
 17 Dec. VK3-General meeting (note third Fri.); Gosford meeting.

NEW SOUTH WALES

SEPTEMBER GENERAL MEETING

The Sept. general meeting held on Friday, 14th, heard a most interesting lecture given by Mr. C. Allan, VK3BLC, the N.S.W. Civil Defence Communications Officer. Charlie's subject was of course the Civil Defence Organisation. A vote of thanks was moved by P. Hesly and carried in the usual manner.

Remember the December general meeting is on Friday, 17th, which is the third Friday of the month.

CONCESSIONAL MEMBERSHIP

That concessional membership be granted to pensioners and full-time students, provided they make application to Council for consideration by an appointed committee which will consider each application on its merits. The rate will be 50 per cent of the fees which normally prevail at that status.

That the previous motion be retrospective to 1st March, 1971, provided application is made before 30th November.

SEPT. 2 METRE FOX HUNT

The fox was VK3QA and the final location was Widdoway St. at 11.00 AM. The hunt was 25 minutes; 2nd, VK3ZGX; 3rd, VK3ZTD. Six cars at start at North Ryde. All hounds enjoyed a delicious supper prepared exquisitely by Mrs. Lark, evening finished at approx. 10.15 p.m. (Car VK3ZGX, Contest Manager.)

NEPEAN DISTRICT AMATEUR RADIO CLUB FIELD DAY, 26th SEPT. 1971

About 100 persons in all enjoyed the N.D. A.R.C. annual field day in ideal weather conditions. Some difficulty was experienced by the 7 MHz. hounds in the morning, but a re-

run saw Dave VK1AWZ 1st—but still no second place gets there. The special event—the smallest tunable home-brew receiver—posed a problem for the independent judges (Tim VK3ETM and Tony VK3ZGY) with the multimeter price going to local club member Leo Michalik. Carl VK3ZGX did very well with three firsts and two seconds. Congratulations to Carl and all other prize winners. Dave VK3ZZN did not do too badly either.

An antique display was given by courtesy of Harold VK3VH with a very old working unit of many varieties. Harold's technical quiz of "Jacobs Ladder" got many in for a prize of a pair of stereo phones.

What happened to the cryptic clue starters? They couldn't find the fox, nor their way back—some arrived back after prize giving at 4.30 p.m. The club hopes that everyone had a good time and hope to see you all again next year with your friends. Thanks also to our many donor firms and the N.S.W. W.I.A. Executive for generous support. (Publicity Officer, N.D. A.R.C.)

MEMBERSHIP APPLICATIONS PRESENTED GENERAL MEETING, 21/9/71

- Mr. R. Atkinson, 39 Macdonnell St., Yarrahulima, A.C.T. 2608. Assoc.
 Mr. H. A. Burns, 200 Gull Flinders (N.G.), P.O. Box 900, Port Moresby, P. VK3HB, Full.
 Mr. G. Rankley, 4 Chambers St., East Maitland, N.S.W. 2223. VK3ZDR, Full.
 Mr. D. Ford, School Residence, Austimere, N.S.W. 2214. Assoc.
 Mr. R. N. Thomas, 2 Trebor Rd., Pennant Hills, N.S.W., 2110. Assoc.
 Three OK Youth Radio Club, C/o. G. Hunnaker (VK3GPO), 2 Trebor Ave., Taree, N.S.W. 2430. VK3BRC, Full.

VICTORIA

MODIFICATION TO MEMORANDUM AND ARTICLES OF ASSOCIATION

Council has given consideration to proposals aimed at widening members' representation on Council. These proposals have been forwarded to the Division's legal advisers and it is hoped that they may be implemented soon.

NORSE CLASS

A Saturday morning Norse Class has commenced, preparing students for the February 1972 examination. The scale of fees has been decided to give the benefit of worthwhile reductions to both full and associate members. The class is open to all and the fees are:

Full members	— \$5.00
Associate members	— \$3.00
Non-members	— \$2.00

For further details contact the Divisional office on 41-3535.

E.D.P. SYSTEM

The Division's records are being put on an E.D.P. system and your next renewal notice will be made out in this way. It is hoped to effect significant economies by the use of the E.D.P. system for membership records.

LIVLADLE CENTENARY CELEBRATIONS

The Eastern and Mountain District Radio Club will be participating in the Livladle Shire Centenary Celebrations during the week of the 12th to 18th February, 1972. The club intends to set up displays and to operate the club station VK3ER on all bands during the celebrations. This is to be done in order to draw attention to the club and to provide a favourable publicity for Amateur Radio.

A multi-colour commemorative QSL card has been struck for the occasion. Contacts with VK3ER will also count as 2 points towards the club's Southern Cross Award (details last issue). (VK3AUI)

SOUTH AUSTRALIA

The Sept. Divisional meeting was well attended to hear a lecture by Rex Vinycomb describing the undernominational mission radio station ELJW in Liberia Africa. Members observed respect to the memory of Joe Kilgariff, VK3JLT, an old timer quite active until recently with the assistance of Max VK3ZGX. Copies of information about Morse licensing were distributed for sub-committee discussions which should report at the Nov. meeting. Marshall VK3GQ's motion to go ahead with the swap and swap carried details further on. The 23rd Nov. Divisional meeting will hear a lecture from Al VK3MP on slow wave tubes, a field of experimenting gaining popularity on h.f.

The Nov. V.H.F. Group meeting on Friday, 5th, will be a visit to a live tv. production. For the V.H.F. Group Picnic (see Div. Calendar) good activities have been planned to keep the odd moments filled for all.

ACTIVITIES

The section leaders in the August VK3A contest on h.f. and v.h.f. were:

Full licensees, metropolitan—VK3BW. Full licensees, country—VK3DK. Limited licensees, metropolitan—VK3ZLZ. Limited licensees, country—VK3ZTL. C.w. entries—VK3ZGX. Multi-operator station—VK3LPL.

Details are in the October Journal. Marshall VK3GQ has brought an idea from his native Detroit that could prove very popular. His swap and shop proposal is an advance on the standard jumble sale auctions which have been flooded with low grade equipment. This idea which has gained huge popularity in the U.S. is for a Sunday afternoon gathering where members can bring good equipment now gathering dust, and by renting suitable space, do their own bargaining with ease. The only financial advantage to the Division is a door entry charge proposed at 20 cents per car. Multiple space rental fee, again proposed is 20 cents.

Marshall's committee of Phil VK3NN, Arn VK3XV and Jim VK3NB have organised the swap and shop for Sunday, 14th Nov., from 12 noon till 5 p.m. at Symon's Place, Adelaide, behind the Repech building, King William St., which has plenty of parking space. This is a most enjoyable afternoon, just meeting old friends, but to make it the huge snowball it can be, everybody must bring something to sell, so don't leave it to the next chap, that half completed transmitter will be useful to someone. (Bart VK3GZ)

WESTERN AUSTRALIA

350 questionnaires were sent out in February to all members of the Division and 233 were returned, of which 188 were completed. The nature of the return was most informative. 23 per cent. had been members for less than two years and 26 per cent. had been members over 10 years. 36 per cent. did not use the QSL Bureau at all, and of those who did use the Bureau 50 per cent. get their cards at Divisional meetings. Nearly everyone believed the Division should have cash in the bank, the majority favouring a kitty of \$500 to \$1,000. The majority thought that the full member subscription should be \$10 or between \$8 and \$10.

In the listings of how the Division could improve its appeal, the majority thought there should be club premises with facilities, gear, libraries and streamlining business with ease on time. Some wanted more social functions and more publicity. Way down the list were specific ideas such as news services on the grounds, less sniping at Council, encouraging Y.R.C.S., greater membership and so on.

Full details of the results of the questionnaire were listed in the W.A. Bulletin for July and is interesting study material.

VICTORIAN DIVISION W.I.A.

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Further details from the W.I.A. Broadcasts or Zonn Secretary, Bill Clark, VK3FY, High St., Kangaroo Flats, 3555.

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1386	ZL1SZ	1402	YU4RL	1409	UK4AW
1387	YL4ECO	1403	ZL4ABC	1410	UK2FAD
1388	AX3TB	1404	DL1ES	1411	UA0FD
1389	WD2/3	1405	AX4ZT	1412	PA4TZ
1400	JAIWVK	1406	ZL1AS	1413	G3ZY
		1407	UA0ZS		

D.X.C.C.

The following additions have been made to the Australian D.X.C.C. Countries list:

3C0—Annohob
—Abu Ali, Jabal at Tair
—Melish Reef

Although offered no as yet taken place from Melish Reef, credit will be given to any future operation there.

VKS HEARD ON 160 METRES

The following table is an analysis of VK calls heard on 160 metres in Western Australia during 1970, showing monthly figures, the result of 289 daily checks. All calls were counted once only on any one date. The aggregate total shows an increase over 1969 of 81 per cent.

Month	VK1	VK2	VK3	VK4	VK5	VK6	VK7	VK9
Jan.	0	0	11	0	3	6	0	0
Feb.	0	0	0	0	0	0	0	0
Mar.	0	0	0	0	0	0	0	0
Apr.	0	0	7	0	2	0	0	0
May	0	0	13	1	10	9	3	0
Jun.	0	0	3	0	9	0	0	0
Jul.	0	0	0	11	23	0	0	0
Aug.	0	0	4	20	0	11	25	0
Sep.	7	7	40	0	12	18	0	0
Oct.	7	7	30	0	8	29	0	0
Nov.	0	0	3	0	8	20	0	0
Dec.	8	0	3	0	3	20	0	0

Totals 14 28 144 1 73 182 3 1

—George Allen, L6842.

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VK2AGH—G. Hall
VK3AIC—J. Neideck
VK3ZQR—G. Thomson
VK4KZ—C. C. M. Couchman

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FOR SALE: As new Trio TS610 Transceiver plus matching 240V AC mains power supply and matching remote VFO 52. All facilities provided and 100w p.p.s. Suitable for VHF Transmitter operation also. This is the latest transceiver from Trio. Mic and desk stand, connecting leads, plugs, handbooks, alignment tool, spare relay and spare set of valves included. Priced for quick sale, \$425. Phone or telegram Melbourne (03) 20-4299, VK3ZZA.

FOR SALE: Collins KWM2 with attached PM1 Power Supply Inc. Speaker, Collins MM1 Mike, suitcase job, \$650, cost \$1900. Webster Bandsplitter, \$20. Johnson Matchbox with SWR meter, etc. \$50. Mosley Tribrander TR3 J, with motor and remote control, \$90. BC221 with book and service manual, \$40. AC powered, \$35. Tels 8630 the lot, Kinross, Flat 17, 417 Toorak Rd., Vic., 3142, or phone 24-8513.

FOR SALE: FT-DX-400 with matching Speaker, circuit and instruction book. Unit is just over two years old and is as new condition, \$350. Kyritus SWR meter, \$15. Astatic Microphone with desk stand, \$25 (new price \$60). Tels is the ideal microphone for SSB. For the lot will accept \$390. I. Brown, VK0D6, 32 Dulgarn St., Cairns, Oid., 4870.

FOR SALE: Complete Sideband Station; 300 watt PEI Phase Transmitter, heavy duty Power Supplies, modified AS7 Receiver, Crystal Converter, 40-20-15, the lot for \$130. VK4NB, 95 Gatton St., Mt. Gravatt, Oid., 4122. Phone 49-4615.

FOR SALE: Linear Amplifier, 80 through 10 metres, GG parallel 4-600As, capable of 1 KW PEI and matching PS. Fully metered and safety protected. Forced air cooled. \$170 o.s.b. Contact R. Wyllie, VK3BSE, Phone 3311 Ext. 454 or A.H. 12 Balmoral St., Laverton, Vic.

FOR SALE: MR20A 2 PM Transceiver, \$140 final. FT pre-amp, 3-channel relay switching, A.W.A. Cermet power unit, Mobile power supply and controlling gear. The lot, \$50. Tim Robinson, VK2YBP, 32 Warendale Rd., Ringwood, Vic., 3194. Phone (03) 870-5302.

FOR SALE: National NC300 Receiver, 160 to 10 metres, plus VHF Converter bands, Xtal Filter and Calibrator, switched selectivity, etc. Excellent physical and working condition. Price \$195 or best offer. VK2GR, 18 Queens Rd., Asquith, N.S.W., 2078. Phone 47-4344 (Syd.).

FOR SALE: Splendid Grundig Satellit 601 Portable Receiver, complete, SSB/CW, also normal AM and FM, torch cells or mains cells or power, \$240. Honda E800E small portable electric generator, good condition, AC 50 Hz., to 1 KW., plus 12 volt DC output, \$180. KUG200A Transceiver, complete (includes 160 cm. average condenser, 100 cm. condenser and mobile PS \$65, VK3CIF, C/o. Federal Executive.

FOR SALE: Swan 350 5-band Transceiver, complete with AC Power Supply, 100 watt, 1000 watt, Manual plus D.C. Mobile Supply, deceased estate, best offer as of G. Sablin, 27 Fishbourne Rd., North Manly N.S.W., 2100.

FOR SALE: Translater tube Vidicon Deflection Yokes, \$10. Vidicon, one inch, 2nd, \$12. \$1.00 (F) C.R. 11029 Nirta Digital Counter Tubes, \$50. 2305S Counter Tubes, \$1. Contact VK3ZPM, Phone 470-2204 (Syd.).

FOR SALE: Trio JRB0 Receiver, excel. condition, \$140 o.s.b. SCR522 Transmitter, working on 2 m. AM. 4 channels plus 240 v. power supply, \$50. MRPD Low Band Transmitter only, \$5. VK2ZAR, 131 Tudor St., Hamilton, Newcastle, N.S.W., 2363. Phone 60-1498.

FOR SALE: 200W PEI Multi-band SSB Transceiver, mechanically complete, part wired, \$88. New 9 MHz. Xtal Filter and Carrier Xtals, \$24. AC PSU to suit above and Xtals Transceiver, \$18, or \$65 the lot. 68 Orchard St., Glen Waverley, Vic. Phone 322-9402.

MARCONI A704 Navigation-Communication Receiver, 105 to 136 MHz. 50 channels, capable of 100 channels and 20 crystals installed of 36 total. Triple conversion, modulation construction, 400 Hz., 220V. power supply. Easily converted to 240V. a.c. \$50. Phone 55-1538, Melbourne.

WANTED: A.B.R.L. Handbook, 1955-60 vintage. Phone 359-1393 (Melb.).

WANTED: Band-change motors and I-R indicator for transformer to suit 24 volt Bendix M920 Radio Compass sets. Transformers are marked T16 or A15064. State price required. Also Vintage A16 complete with Horn Speaker, early 1959 a good price paid and O'Brien, Edgemoor, San. Vito, Vic., 3025. Phone 107.

WANTED: FL-2000B, FLOX-200 or SB-200 Linear Amplifier. Must be in first class condition, by R. K. Lyon, VK0LKL, 450 Riverton Drive, Riverton, N.A. 6155.

WANTED: Murphy British Naval VLF Receiver or similar type tuning down to 10 KHz. or lower. R. F. Fisher, VK3AD, 241 Riverton Drive, Melbourne, Vic., 3032. Phone (business hours) 340-5831.

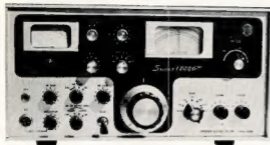
WANTED: Rotary Converter to restore R.A. Type 5 Synchronous Rotary Gap Spark Transmitter. Output 70 v.a.c. at high frequency, probably 500 Hz. Unit will probably have 24 field poles and can be identified by an extension shaft coming out one end for driving rotary gap. R. F. Fisher, VK3AD, 241 Riverton Drive, Parkville, Vic., 3052. Phone 340-5831 (business hours).

WANTED: Vintage "Wireless" components of 1920s era for restoration of early receivers, particularly 4-volt triodes, horn-type or separate loudspeakers, Philips or other type "battery eliminator" supply particularly required. Also early wireless literature. Write to 22 Prince Crescent, Shepparton, Vic. Phone Shepp. 21-2367.

WANTED: Wire Recorder 240V. AC Pyrex or similar. Pre-1930. Wireline, books, or any other material. Colin Gracie, Post Office, Caversham, Vic., 3406.

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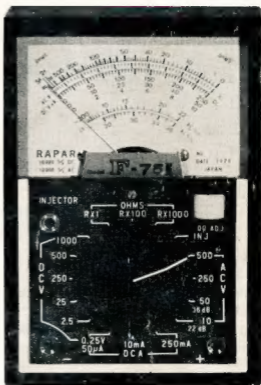
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